Bilingualism and Readability in written language production

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Abstract: The present study concerns 39 samples out of 150 in total produced by one bilingual student of a primary school in Germany and including both simple and short sentences as well as more complex or in some cases complete paragraphs. The language of writing is German, while the mother tongue is Greek. The purpose of the research is to highlight the ease or difficulties that a bilingual student faces in producing written language and which factors (e.g. vocabulary, grammar, syntax, level of text difficulty) influence the final result. Tableau Public was used for the statistical analysis, while all 39 samples were first digitized manually in Word format. They were then analyzed with the Flesch-Kincaid and Gunning Fog Readability formulas, the results of which were carefully transferred to an Excel spreadsheet. The final results showed that there is a relative comfort in the use of more advanced vocabulary as well as the use of subordinate clauses compared to the age of 8-11. The creation of a database would perhaps contribute even more to the academic and educational community in terms of a more fair evaluation of texts produced by bilingual primary school students.

Keywords: *Readability, bilingualism, assessment, primary school.*

Introduction

We often encounter bilingual students (Dmitrieva et al., 2021) who have difficulties in producing written language, resulting in difficulties for the teacher during assessment or when trying to help the student to improve his/her performance. The main challenges and difficulties faced by a bilingual student, especially of this age, during primary education, growing up in a multicultural environment (Peace-Hughes et al., 2021), e.g. in this research, with two Greek parents and studying in a German primary school with other classmates, mostly native speakers of a foreign language or (and) with classmates who are native speakers of different languages, if German is used as the main language, it is the selection of appropriate vocabulary, understanding the instructions of a topic that needs to be developed, spelling, correct verb conjugation, and vocabulary breadth which are important elements for measuring Readability in written texts (Simanullang et al., 2022).

On the other hand, this potential difficulty for the bilingual student to correctly combine words with each other to create a complete sentence (Nahatame, 2023), to form a flow, coherence and coherence between sentences, to write simple or complex monosyllabic or polysyllabic words without spelling errors (Bellocchi et al., 2017), to correctly inflect verbs by tense, person and number (grammar rules of German language), each factor, possibly combined together or individually, forms the profile of a bilingual student in the first grades of primary school (Kormi-Nouri et al., 2010), during which he/she tries to distinguish, perhaps even unconsciously, significant differences between his/her mother tongue (Greek) and the language spoken every day (German in the specific samples) in a German public school.

Recent research also raises possible difficulties in integrating immigrant children into the school environment, as they appear to simultaneously face difficulty in their oral interaction with their classmates, since in some cases serious deficiencies in vocabulary are observed (Helot & Young, 2010).

Therefore, bilingual students hesitate to communicate with their classmates, fearing rejection, bullying, or misunderstanding if they do not express themselves adequately in the common spoken language which would be German in this case.

On the other hand, in the production of written language, the above difficulties are probably more easily reflected as the bilingual student tries to apply and decode rules of grammar and syntax that he has assimilated in school. However, because similar rules are also introduced in his native language, he sometimes ends up confused by confusing the way he pronounces words or using vocabulary that he does not remember well or does not remember at all (Beinborn et al., 2014). It becomes even more difficult to perceive the need to distinguish and use these rules when the bilingual student also attends Greek school, as in the present study. Nevertheless, there are several benefits to being a bilingual student in an intercultural school environment, such as faster learning of a third or fourth language compared to monolingual students (Kempert et al., 2011).

For all the aforementioned reasons, 39 out of approximately 150 samples have been collected from a primary school in North Germany in the 1980s regarding one student of elementary school.

The purpose of the research is to discover all those characteristics that make up the profile of a bilingual student, as he/she tries to form the most complete words, sentences and paragraphs possible based on the rules of grammar and syntax of German as the main language (Wischmeier, 2012), while in this research, in the family environment the mother tongue, i.e. Greek, is used from time to time.

By discovering these characteristics, one will be able to identify the eases or difficulties of a bilingual student, while it is desirable that similar research be followed by other scientists, so as to find common factors that may influence bilingual students during the production of written language, and consequently the degree of Readability of the texts (Karaman, 2024).

At the beginning of this research, the main objectives of this study will be mentioned first of all regarding the reasons why this research was initiated:

I.   Which variables influence more or less a primary school student whose mother tongue is different from the one in which he composes sentences or texts on a daily basis at school?

II.   What are the difficulties or eases faced by a minor user of the first language while simultaneously being a user of his mother tongue?

III.   What factors may contribute to the more effective use of specific variables such as vocabulary, type of vocabulary, spelled words, correct declension of verbs and nouns, etc.?

IV.   Can a bilingual student confuse vocabulary or grammatical phenomena from his native language in the daily spoken language at school? If so, what are the factors that influence this result?

Finally, collecting more results from similar studies could contribute to the construction of a Readability formula such as Gunning Fog and Flesch-Kincaid (Kapeta, 2020) for a more objective, reliable and fair evaluation of tests (validity) in schools in order to assist also bilingual students and monolingual students simultaneously (Kapeta, 2020).

Methodology

Initially, it should be said that from a multitude of samples from the distant past of the 1980s-1990s, 39 samples out of 150 were selected at random during the first stage. The texts were taken from grades 2 to 5 of German elementary school and are sometimes single words, sentences or paragraphs, while all the productions are part of various tests.

The most difficult stage of the present research was the digitization of the samples in the second phase, as well as the precise manual transfer of all data from Word to digital measurement platforms such as Flesch-Kincaid (Courtis & Hassan, 2002) and Gunning Fog in the third phase, as well as the careful manual transfer of the results to the Excel table in the fourth phase.

In the fifth stage, the Excel table was introduced into the modern statistical analysis software Tableau Public, from which the last phase emerged, i.e. the final product of the present study, in other words the most important variables with which the general picture of a bilingual student can be formed. These variables determine the level of language proficiency and the degree of difficulty in written language.

1st phase: Sampling source	German school tests Salzgitter Thiede
Chronological range of samples	1988-1990
Number of samples	39 out of 150 by random draw
Primary School classes surveyed	2nd-5th grade
2nd phase: Sample digitization tool	Word 10
3rd phase: Formulas used	Flesh-Kincaid, Gunning Fog Index
4th phase: Database import program	Excel
5th phase: Statistical analysis tool	Tableau Public
6th phase: Final product	Important factors

Table 1: Research methodology

Results and discussion

In the following paragraphs, the most important results of this study will shape the final product in the last section of this article regarding the research conclusions.

In figure 1, we see in 39 samples an average evaluation score of 2.89%, approximately 3%, and an average Gunning Fog index of 0.16%, results that appear to be very satisfactory regarding the bilingual student's ability to form words, sentences, even paragraphs in a correct way by using the right spelling form in German, the right connectors and vocabulary in order to achieve an adapt flow between the sentences, a sufficient number of word and sentence length within a paragraph.
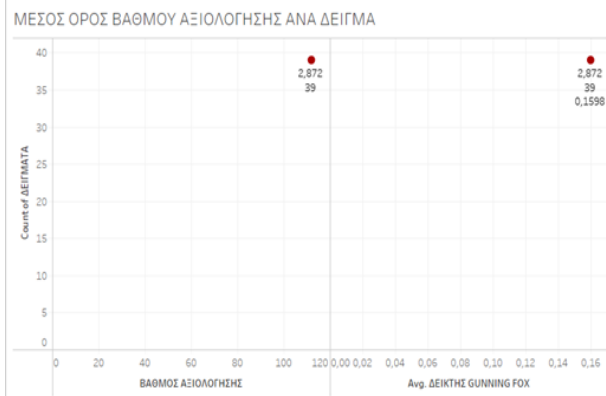
ΜΕΣΟΣ ΟΡΟΣ ΒΑΘΜΟΥ ΑΞΙΟΛΟΓΗΣΗΣ ΑΝΑ ΔΕΙΓΜΑ

Figure 1: Average evaluation score per sample (left column) and average Gunning

Fog index (right column) for 39 samples

In figure 2, we see in 39 samples an average of 116 syllables, an average number of words of 70.7% and an average number of characters of 487.5%. And in these results we could say that there is a positive sign in the performance of the bilingual student, since it is often difficult to produce sentences or paragraphs even by users of German as a mother tongue at these ages.
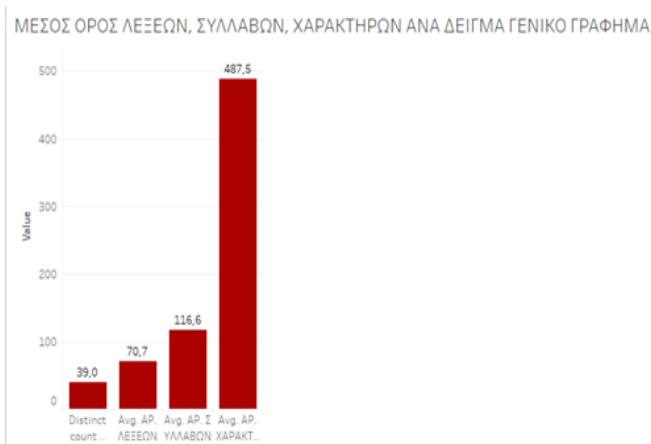

ΜΕΣΟΣ ΟΡΟΣ ΛΕΞΕΩΝ, ΣΥΛΛΑΒΩΝ, ΧΑΡΑΚΤΗΡΩΝ ΑΝΑ ΔΕΙΓΜΑ ΓΕΝΙΚΟ ΓΡΑΦΗΜΑ

Figure 2: (From left to right in the bottom) Average of words, syllables, characters per sample

Figure 3 is very important as only 2 samples out of 39 are off topic. The bilingual student seems to understand most of the topic instructions and answers to the point without any particular difficulties. This result seems to be of high importance because sometimes it is almost difficult for monolinguists to understand the meaning or concept of a test in order to achieve positive or high scores. Moreover, since the samples selected are of different ages and grades, comparing from lower grades up to higher grades, we observe an improvement of performance. This is also a very interesting factor because though tests might be more difficult in higher grades, scores are also high and the written productions are also within the topic. Understanding the instructions and answering them in a correct way has a positive impact on the final results of this study as mentioned in the conclusion of this article.
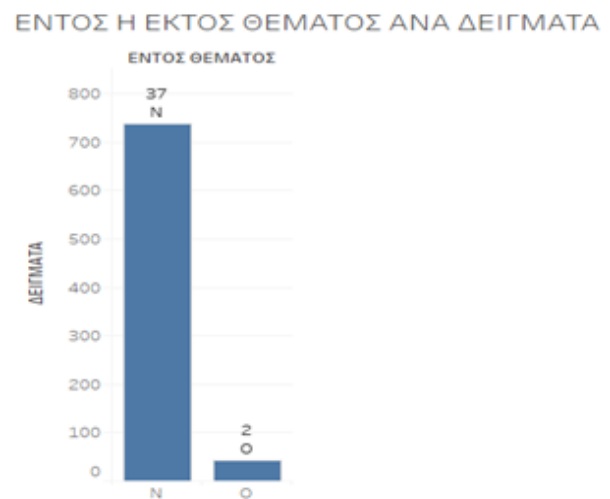
ΕΝΤΟΣ Η ΕΚΤΟΣ ΘΕΜΑΤΟΣ ΑΝΑ ΔΕΙΓΜΑΤΑ

ΕΝΤΟΣ ΘΕΜΑΤΟΣ

Figure 3: Within (N = Yes) or outside (O = No) topic per samples

The average degree of ease presents a value of 0.32% which perhaps indicates the language level of the samples representing the first grades of the primary school. A lower percentage also means a lower educational level. Therefore, in this example we obtain compatible results.
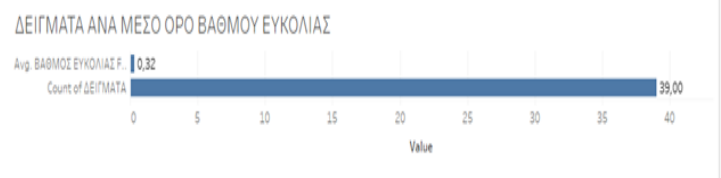

ΔΕΙΓΜΑΤΑ ΑΝΑ ΜΕΣΟ ΟΡΟ ΒΑΘΜΟΥ ΕΥΚΟΛΙΑΣ

Figure 4: Samples by average Flesch-Kincaid ease level

On the other side, in figure 5, regarding the average Gunning Fog Readability index, in the 39 samples it occupies 0.16%, which is normal for the first grades of Primary School, as it is expected that there will be lower values up to the 6th grade of Primary School. The higher the grades of study up to tertiary education, the greater the degree of difficulty, i.e. Readability (Dressler et al., 2024).
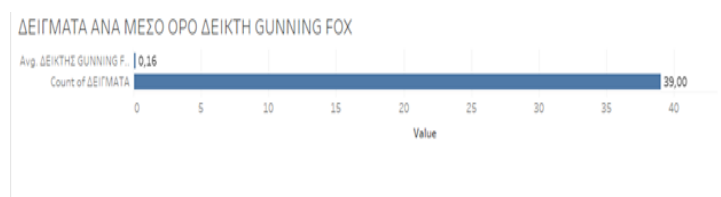

ΔΕΙΓΜΑΤΑ ΑΝΑ ΜΕΣΟ ΟΡΟ ΔΕΙΚΤΗ GUNNING FOX

Figure 5: Samples per average of Gunning Fog Index

In figure 6, it is observed that in 39 samples the average of spelling errors is approximately 3, while the average Flesch-Kincaid difficulty level is 0.13%, so satisfactory for a primary school student who is bilingual, something we constantly emphasize, as one would expect him/her to confuse Greek vocabulary with German and have greater difficulty in spelling or in the correct use of vocabulary.

ΔΕΙΓΜΑΤΑ ΑΝΑ ΜΕΣΟ ΟΡΟ ΒΑΘΜΟ ΔΥΣΚΟΛΙΑΣ ΚΑΙ ΟΡΘΟΓΡΑΦΙΚΩΝ ΛΑΘΩΝ

Figure 6: Samples by average Flesch-Kincaid difficulty level and spelling errors

Conclusion

Summarizing, observing in detail the aforementioned results through all the above figures, a bilingual student seems to have a small degree of difficulty in memorizing more unusual words. This fact is perhaps considered normal as we are talking about a user of the German language as a daily spoken language and Greek as a native language, as well as the age factor. All in all, the results seem to be encouraging, since it is difficult for a bilingual first-grade elementary school student to correctly compose the appropriate vocabulary without spelling errors or to combine many sentences or words into a whole so that there is a good flow of written language.

Although there is possible confusion of vocabulary or grammatical rules between the German and Greek language, the student appears to be responding to the exams and showing relative progress from one grade to the next.

Multisyllabic words or vocabulary associated with specific subjects such as History or Geography seem to be more difficult for a bilingual student to use or memorize than words included in his/her everyday vocabulary.

The teacher, on the other hand, should evaluate the bilingual student and the tests in a perhaps more objective manner using some modern digital Readability tool.

In the future, a test measurement tool (Lee & Vajjala, 2022) could be constructed with an emphasis on measuring texts produced by bilingual users of a language in order to create a common database for all grades and in different schools in Greece or even in a more international level.

Through modern tools it might be possible to distinguish the most important difficulties of bilingual students in order to create even more appropriate educational material depending on the educational needs of the class and the age group with the ultimate goal of allowing bilingual students to deepen their knowledge in an easier and more modern way and to expand even further in scientific fields by grade and age.

References

1. Beinborn, L., Zesch, T., Gurevych, I. (2014). Readability for foreign language learning: The importance of cognates. *ITL - International Journal of Applied Linguistics,* 165(2), 136-162. https://doi.org/10.1075/itl.165.2.02bei

2. Bellocchi, S., Tobia, V., Bonifacci, P. (2017). Predictors of reading and comprehension abilities in bilingual and monolingual children: a longitudinal study on a transparent language. *Springer Nature Link*, 30, 1311–1334. https://link.springer.com/article/10.1007/s11145-017-9725-5

3. Courtis, J. K., Hassan, S. (2002). Reading Ease of Bilingual Annual Reports. *International of Business and Communication,* 39(4). https://doi.org/10.1177/00219436020390

4. Dmitrieva, A., Laposhina A., Lebedeva, M. (2021) A Comparative Study of Educational Texts for Native, Foreign, and Bilingual Young Speakers of Russian: Are Simplified Texts Equally Simple? *Frontiers in Psychololgy.* https://doi.org.10.3389/fpsyg.2021.703690

5. Dressler, R., Nuss, B., Mueller, K. (2024). The readability of books for immersion schoolsUnderstanding the role of text complexity, context and literary aspects. *Journal of Immersion and Content-Based Language Education*, 13(1), 123 – 137. https://doi.org/10.1075/jicb.24001.dre

6. Helot, C., Young, A. (2010). Bilingualism and Language Education in French Primary Schools: Why and How Should Migrant Languages be Valued? *International Journal of Bilingual Education and Bilingualism*. 96-112. https://doi.org/10.1080/13670050208667749

7. Karaman, Ş. (2024). Determination of Readability Levels of Texts in 7th and 8th Grade Turkish and Turkish Culture Textbooks. *Turkophone,* 11(1), 1-9.

8. Lee, J., Vajjala, S. (2022). *A Neural Pairwise Ranking Model for Readability Assessment.* Cornell University. Retrieved 13/05/2025 from https://doi.org/10.48550/arXiv.2203.07450

9. Kapeta, C. (2020). *Criteria to determinate the level and difficulty of written production.* Doctoral thesis. http://hdl.handle.net/10442/hedi/48653

10. Kempert, S., Saalbach, H., Hardy, I. (2011). Cognitive benefits and costs of bilingualism in elementary school students: The case of mathematical word problems. *Journal of Educational Psychology*, 103(3), 547-561. https://psycnet.apa.org/buy/2011-12689-001

11. Kormi-Nouri, R., Moradi, A-R., Moradi, S., Akbari-Zardkhaneh, S., Zahedian, H. (2010). The effect of bilingualism on letter and category fluency tasks in primary school children: Advantage or disadvantage? *Bilingualism: Language and Cognition*, 15(2) , 351-364. https://doi.org/10.1017/S1366728910000192

12. Nahatame, S. (2023). Predicting processing effort during L1 and L2 reading: The relationship between text linguistic features and eye movements. *Bilingualism: Language and Cognition,* 26(4), 724 – 737. https://doi.org/10.1017/S136672892200089X

13. Peace-Hughes, T., de Lima, P., Bronwen, C., Jamieson, L., Tisdall, E. K. M., C., Sorace, A. (2021). What do children think of their own bilingualism? Exploring bilingual children's attitudes and perceptions. *International Journal of Bilingualism.* 25(5). https://doi.org/10.1177/13670069211000853

14. Simanullang, K., Sipayung, K., Kammer Tuahman Sipayung, & Harpen Silitonga. (2022). THE READABILITY OF BILINGUAL COMIC "WOW OF CINDERELLA" TRANSLATION TECHNIQUES. *Jurnal Scientia*, *11*(02), 92-96. Retrieved from https://infor.seaninstitute.org/index.php/pendidikan/article/view/760

15. Wischmeier, I. (2012). *Primary School Teachers' Beliefs about Bilingualism.* Retrieved 13/05/2025 from https://shorturl.at/zFkZe