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LANGUAGE USE: A STUDY ON THE DIFFERENCES BETWEEN SCIENTIFIC TEXTS, NON-SCIENTIFIC TEXTS AND ORAL EXPRESSION

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Abstract

There are differences between language use in scientific context and its use in the context of oral communication. While some sentence structures, expressions and words are frequently used in scientific writings and expressions, they are used less in daily written and spoken language. In this study, an attempt was made to reach a conclusion by scanning 50 randomly selected adjectives in the Turkish National Corpus in three categories: academic texts, non-academic texts and oral expression. The frequency of words in the adjective category used in scientific prose, non-scientific prose and oral expression was examined. The findings revealed that while some words are frequently used in scientific prose, they are not used at all in oral expression, and likewise, some words are used less in non-scientific prose. The reason why adjectives are examined in this study is because adjectives are more subjective expressions. Subjective expressions can be more easily evaluated for use in different contexts.

Keywords: Language use, scientific texts, non-scientific texts, oral expression

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Introduction

The term scientific language refers to the language used both in written and spoken forms in scientific settings. This term is usually confused with academic language. It is significantly more formal and complex than informal spoken language. Each field has its own terminology and linguistic function. Academic language also includes syntax, rhetoric, and other basic academic jargon that extends to all fields. Students need a good understanding of basic academic language to understand the meanings of words and how they are used in a variety of situations and topics. Language is the main resource or tool that teachers and students use for communication purposes in the classroom.

It is important to provide language proficiency to ensure the academic success of students with different linguistic and cultural experiences. Academic and scientific language is a language that native language users frequently use when communicating in school environments and academic contexts, and it is not always possible to make a sharp distinction between it and everyday language use. The productive use of language takes place in both written and oral contexts. Competent use of language is a content that should be included in the curriculum and program at every stage, from primary education to university. Its use in academic language practice and education is quite common. Academic language consists of strategies that should be taken into consideration in both mother tongue teaching and foreign language teaching. It is obligatory to understand the responsibilities, aspects and underlying ideas of academic language as well as the developmental nature of language learning (Rao, 2022).

Differences Between Scientific Language and Academic Language

Nowadays, concepts such as academic language, scientific language, professional language, specific purpose language and official language are used interchangeably. However, it should be clarified that there are differences between these areas.

In the related literature scientific language and academic language is sometimes used interchangeably. Aduriz-Bravo, Chion and Pujalte (2015) state that scientific language is a universal language which is taught since primary schools. However, in the natural and exact science disciplines like

biology, chemistry, physics, maths, engineering, medicine etc. science education can be interpreted as second socialization into science community which has its own representations, terminologies, methods and jargons.

How language changes according to context and purpose is one of the most important outcomes of language teaching. If language use varies depending on its use in different contexts, students need to develop language proficiencies appropriate for use in different contexts. Regarding this, Cummins (1979) emphasized that language proficiency has two dimensions: Basic Interpersonal Communication Skills and Cognitive Academic Language Proficiency. Basic Interpersonal Communication Skills is used in our daily lives, for example, in conversations with family members and friends, in informal interactions with store clerks when we go shopping, or in casual conversations on Facebook, WhatsApp, Twitter or internet forums, to understand and discuss academic topics in the classroom, in school assignments and exams. We use these topics to read and write. Individuals' basic communication skills and academic language competencies develop at different levels and processes.

When we look at academic and scientific genres, the general communicative purposes and textual features and structures of texts written in both native and foreign languages are similar to each other. For example, a scientific text describing flowering plants will likely have a similar general purpose and textual structure, whether in the native language or a foreign language. Considering the increasingly universal trends in scientific discourses, genres and texts in scientific contexts belonging to different societies have more common features than differences. In this context, the universality of academic language and scientific language can be mentioned.

Halliday and Hasan (1976) talk about the concepts in register theory to have a metalanguage. These are: field, tenor and mode. Together with these three factors the choices we make in a text depend on the overall purpose and situation of the communication. When we produce a text, we constantly make choices between different words, grammatical patterns, and different ways of organizing or structuring the text (Lin, 2016).

Differences Between Everyday Language Use and Scientific Language Use

Social distance affects the choice of language used. It is necessary to distinguish between language use and language preferences. There are many independent variables that affect language use and language preferences. These differences are also observed according to social class, age and gender. Each of these factors affects how similar or different the language of various speakers is.

People who are in the same geographical area and are related as close friends or family members may use language that reflects their close relationship, and this language may not always be transparent to different language users. For example, relatives' speech, sibling speech, or friend speech may be viewed as language used between people with low social distance (and therefore localized) and cannot be interpreted by an outside audience. On the other hand, as social distance increases, the language used becomes closer to the standard language. Language variations may vary depending on near and far social distance. At long social distances, local language use is minimized. In addition, there are differences in usage in written expression and oral expression depending on the context in which the language is used (Mahboob, 2014). It is claimed that there is a language competence that can be evaluated globally, as well as diversity in language use. While it is claimed that there is a direct relationship between language proficiency and the development of cognitive skills and academic performance. It is stated that the development of basic communication skills can be acquired at all intelligence levels in a native language. Language fluency and competence in basic communication skills do not have a direct impact on the development of cognitive/academic language competence. It has been revealed that speaking skills or superficial reading comprehension and listening comprehension skills are not directly related to scientific language proficiency. However, it has been revealed that scientific language proficiency in the mother tongue significantly predicts language proficiency in the second language.

It is important to provide students, especially those learning the language as a foreign language in scientific context, with plenty of support and clear guidance while their transition from casual conversation mode to formal scientific writing mode in their school work (Lin, 2016).

The concept of scientific language developed from research that noted the difficulties due to the differences of the language children used in school and the language of the home and community. This positions children to respond to school literacy tasks in different ways, and also means that the ways some children respond to such tasks align more effortlessly with their teachers' methods than do other children (Heath, 1983).

Students first encounter scientific language when they start school. Not every student's readiness level for the use of this language is the same. The child's awareness of language begins with his/her perception of the differences in the use of language between oral and written texts created for different purposes, as they become familiar with the texts. It has been revealed that children who grow up in families with high levels of education and that attach importance to pre-school education are more competent in many matters such as understanding the difference in style, word choice, syntactic and grammatical accuracy. To encourage the use of language in an academic context, the focus of activities carried out with students should not only be on understanding what they read and listen to correctly or answering questions, but also on the student's correct use of the language should be one of the targeted points. Each student has the potential to use language in different ways, each student has a different language learning history, experience, and a different background, so these differences should be taken into account when interacting with children. It is easier for individuals who have academic competence in their native language to transfer these competences to the foreign languages they learn (Schleppegrell, 2012).

Gottlieb and Ernst-Slavit (2014) state that scientific language is a language competence that requires a certain learning and development process due to its nature, which develops and becomes more detailed in terms of vocabulary and syntax at each grade level. The first language a child acquires differs from the language they encounter at school (Gottlieb & Ernst-Slavit, 2014).

Young and Fry (2008) emphasized the importance of metalinguistic awareness, sociocultural awareness and metacognitive awareness levels in the classroom environment. Scientific language use develops simultaneously with these awarenesses. The possible relationship between metalinguistic awareness and overall academic achievement has not been

widely investigated. There is a direct relationship between metacognitive and metalinguistic development and reading comprehension, but sufficient studies have not been conducted on the extent to which it affects academic success (Tunmer & Myhill, 1984).

Morris (2003) found a strong relationship between performance on a metacognitive grammatical explanation task and academic performance in two separate courses for undergraduate students in Teaching English as a Second Language. This study has shown that in some cases there is a positive correlation between native language acquisition and academic achievement. In similar studies, it was assumed that socioeconomic status may have an impact on exam scores (Spellerberg, 2015).

Scientific Writing

The composition of a scientific written text requires textlinguistic competence and background knowledge on the subject. Textlinguistics is the patterning of the text grammatically, lexically and consistently. In addition to the text meeting the basic cohesion and coherence criteria, the content must be conveyed correctly and in an appropriate style.

The evaluation of scientific written expression is not the same as the criteria for basic written expression. In scientific written expression, in addition to basic principles such as fluency, grammar, word usage, spelling and punctuation, criteria for the correct use of language in a scientific context also come to the fore.

Students must meet these criteria in order to write scientific products at the university level. Students should be constantly reminded and supported to use scientific writing language in all disciplines. Students' metalinguistic awareness can be increased by providing systematic feedback (Doyumğaç, 2022).

Research questions

To what extent are there differences between the frequency of adjectives used in scientific prose and the same adjectives used in non-scientific prose?

To what extent are there differences between the frequency of adjectives used in non-scientific prose and the frequency of use of the same adjectives in oral expression**?**

Method

From the written text query interface in the Turkish National Corpus (TUD), the frequency of use of adjectives in scientific prose, non-scientific prose, and autobiography and oral narrative contexts was examined according to text type and analyzed with the descriptive content analysis method. This query system only includes texts covering the years 1989 and 2013.

Adjectives as the Samples for Scientific Words

The definition of adjective in the Turkish Language Association dictionary is "It comes before a noun and modifies that noun in terms of quality, quantity, place, order, etc.". Adjectives contain more subjectivity when examined in terms of meaning compared to other word categories. For this reason, adjectives were preferred in the context of scientific and non-scientific language use in this study, based on the assumption that it is a category whose use can be observed to change in different contexts.

Creating a corpus for Turkish is a topic that is generally emphasized by researchers working in computer sciences today. In particular, studies aiming at morphosyntactic analysis of Turkish can perform very successful morphosyntactic analyses. A number of standard methods are used when preparing a dictionary. The most important of these methods is the necessity of relying on representative written and oral compilations compiled from the characteristic and typical usage environments of the language (Özkan, 2010).

Data Analysis

In this study, which was carried out using the descriptive analysis method, the use of 50 different adjectives in scientific prose, their use in non-scientific prose and their frequency of use in the context of oral expression were examined. Data is analysed in the excel program from the highest to the lowest frequency and above the average number of frequency is accepted as highest frequency and below as lower frequency. The adjectives had been randomly selected from the dictionary before scanning the corpus. The same adjectives are analysed in written scientific and non-scientific context and also oral expressions.

Findings

Table 1. Distribution of Adjectives in Scientific Texts

Adjectives	Scientific Texts 4989 (*f*) / *49664176* (number of texts)
Alışıldık (common)	9 /10
Amatör (amateur)	46/105
Ampirik (empirical)	155/485
Anlamlı (meaningful)	601/2673
Ardışık (sequential)	48/118
Aristokrat (aristocrat)	33/56
Ayrıntılı (detailed)	619/1617
Bağıntılı (correlated)	36/48
Bakımlı (well-kept)	25/40
Bambaşka (disparate)	69/92
Baskın (dominant)	233/495
Başlıca (primary)	727/2121
Bedava (free of charge)	54/116
Betimsel (descriptive)	34/63
Bilimsel (scientific)	672/3157
Bilişsel (cognitive)	120/621
Cazip (attracting)	164 /282
Ciddi (serious)	744 /2685
Çağdaş (contemporary)	568 / 2385
Çelişkili (contradictory)	165 / 221
Çocuksu (childish)	25 / 33
Çözümsüz (unsolvable)	26 / 64
Deneyimli (experienced)	114 / 164
Deneysel (empirical)	247 /745
Diplomatik (diplomatic)	88 / 244
Doğal (natural)	1114 / 6883
Dostça (easy-going)	59 /91
Duygusal (emotional)	255 /1120
Dürüst (honest)	175 / 342
Edimsel (pragmatic)	19 / 54
Eğitsel (pedagogic)	69 /130
Eleştirel (critical)	186 / 564

Elverişli (convenient)	385 / 849
Fakir (poor)	234 / 483
Fevkalade (extraordinary)	66 / 104
Geçerli (valid)	799 / 2344
Genetik (genetic)	178 / 825
Gereksiz (unnecessary)	329 / 577
Görsel (visual)	243 / 785
Gösterişli (showy)	63 / 89
Güvenilir (reliable)	396 / 810
Harika (wonderful)	40 / 55
Hayalperest (imaginative)	5 / 5
İnandırıcı (convincing)	119 /170
İnsancıl (humane)	90 / 149
Kadük (caducous)	5 / 7
Kalıcı (permanent)	381 / 834
Karmaşık (complicated)	587 / 1429
Muhteşem (magnificient)	81 /143
Sevimsiz (unlikable)	25 / 26
Sinirli (angry)	46 / 69
Şefkatli (compassionate)	21 / 27
Unutkan (forgetful)	5 / 5
Uyumlu (compatible)	490 / 1026
Verimli (fruitful)	506 /1413
Yaramaz (naughty)	87 / 109
Yazınsal (literary)	49 / 191
Yüzeysel (superficial)	211 / 395
Zahmetli (demanding)	45 / 50
Zarif (elegant)	60 / 101

$\bar{x}$: 260

When table 1 is evaluated in terms of frequency of adjectives used in scientific contexts, over 260 is accepted as higher frequency words and below lower. Lower frequently used words are found to be “alışıldık (common), çocuksu (childish), çözümsüz (unsolvable), hayalperest (imaginative), unutkan (forgetful), sevimsiz (unlikable), şefkatli (compassionate)” which have more personal and subjective connotations in

terms of meaning. Those kinds of words usually are not used in scientific contexts.

Table 2. Distribution of Adjectives in Non-Scientific Texts

Adjectives	Non-Scientific Texts 4989 (*f*) / *49664176* (total number of texts)
Alışıldık (common)	8/8
Amatör (amateur)	82/212
Ampirik (empirical)	7/10
Anlamlı (meaningful)	299/709
Ardışık (sequential)	3/7
Aristokrat (aristocrat)	37/43
Ayrıntılı (detailed)	221/401
Bağıntılı (correlated)	9/14
Bakımlı (well-kept)	101/181
Bambaşka (disparate)	225/421
Baskın (dominant)	187/386
Başlıca (primary)	200/464
Bedava (free of charge)	117/192
Betimsel (descriptive)	4/4
Bilimsel (scientific)	299/1162
Bilişsel (cognitive)	9 / 42
Cazip (attracting)	136 /187
Ciddi (serious)	561/2662
Çağdaş (contemporary)	345 / 1482
Çelişkili (contradictory)	99 / 139
Çocuksu (childish)	93 /149
Çözümsüz (unsolvable)	29 / 40
Deneyimli (experienced)	112 / 187
Deneysel (empirical)	31 / 55
Diplomatik (diplomatic)	93 / 225
Doğal (natural)	520 /2598
Dostça (easy-going)	74 /95
Duygusal (emotional)	271 / 933
Dürüst (honest)	361/962
Edimsel (pragmatic)	8 /22
Eğitsel (pedagogic)	17 / 30

Eleştirel (critical)	104 / 225
Elverişli (convenient)	161 / 248
Fakir (poor)	225 / 438
Fevkalade (extraordinary)	108 / 228
Geçerli (valid)	394 / 934
Genetik (genetic)	75 / 232
Gereksiz (unnecessary)	298 / 541
Görsel (visual)	122 / 263
Gösterişli (showy)	84 / 116
Güvenilir (reliable)	195 / 327
Harika (wonderful)	168 / 436
Hayalperest (imaginative)	12 / 14
İnandırıcı (convincing)	157 / 249
İnsancıl (humane)	93 / 162
Kadük (caducous)	3 / 4
Kalıcı (permanent)	221 / 449
Karmaşık (complicated)	250 / 528
Muhteşem (magnificient)	243 / 643
Sevimsiz (unlikable)	77 / 111
Sinirli (angry)	155 / 308
Şefkatli (compassionate)	58 / 90
Unutkan (forgetful)	14 / 17
Uyumlu (compatible)	177 / 311
Verimli (fruitful)	221 / 423
Yaramaz (naughty)	161 / 247
Yazınsal (literary)	35 / 391
Yüzeysel (superficial)	92 / 134
Zahmetli (demanding)	45 / 55
Zarif (elegant)	150 / 285

$\bar{x}$:174

The average frequency of words used in non-scientific contexts was found to be 174. Above 174 was accepted as more frequently used words and below lower.

Table 3. Distribution of Adjectives in Oral Expression

Adjectives	Oral Expression 456 (*f*) / 1014023 (total number of texts)
Alışıldık (common)	0 / 0
Amatör (amateur)	4 / 6
Ampirik (empirical)	0 / 0
Anlamlı (meaningful)	23 / 29
Ardışık (sequential)	1 / 3
Aristokrat (aristocrat)	1 / 1
Ayrıntılı (detailed)	26 / 31
Bağıntılı (correlated)	0 / 0
Bakımlı (well-kept)	4 / 9
Bambaşka (disparate)	14 / 20
Baskın (dominant)	8 / 11
Başlıca (primary)	8 / 12
Bedava (free of charge)	20 / 33
Betimsel (descriptive)	0 / 0
Bilimsel (scientific)	37 / 139
Bilişsel (cognitive)	3 / 11
Cazip (attracting)	10 / 15
Ciddi (serious)	81 / 250
Çağdaş (contemporary)	27 / 58
Çelişkili (contradictory)	5 / 5
Çocuksu (childish)	3 / 3
Çözümsüz (unsolvable)	1 / 1
Deneyimli (experienced)	6 / 8
Deneysel (empirical)	2 / 2
Diplomatik (diplomatic)	7 / 8
Doğal (natural)	67 / 194
Dostça (easy-going)	5 / 5
Duygusal (emotional)	13 / 26
Dürüst (honest)	25 / 43
Edimsel (pragmatic)	0 / 0
Eğitsel (pedagogic)	0 / 0
Eleştirel (critical)	5 / 18
Elverişli (convenient)	5 / 6

Fakir (poor)	13 / 22
Fevkalade (extraordinary)	12 / 34
Geçerli (valid)	32 / 69
Genetik (genetic)	9 / 15
Gereksiz (unnecessary)	24 /31
Görsel (visual)	7 / 36
Gösterişli (showy)	3 / 3
Güvenilir (reliable)	17 / 18
Harika (wonderful)	38 / 68
Hayalperest (imaginative)	1 / 1
İnandırıcı (convincing)	2 / 2
İnsancıl (humane)	5 / 7
Kadük (caducous)	1 / 1
Kalıcı (permanent)	19 / 44
Karmaşık (complicated)	10 / 16
Muhteşem (magnificient)	23 / 47
Sevimsiz (unlikable)	776 / 2170
Sinirli (angry)	13 / 20
Şefkatli (compassionate)	0 / 0
Unutkan (forgetful)	0 / 0
Uyumlu (compatible)	3 / 5
Verimli (fruitful)	20 / 42
Yaramaz (naughty)	14 / 17
Yazınsal (literary)	0 / 0
Yüzeysel (superficial)	2 / 2
Zahmetli (demanding)	1 / 1
Zarif (elegant)	5 / 6

$\bar{x}$: 30

The average of frequency of words used in oral texts was found to be 30. Above 30 is accepted as higher frequency and below as lower frequency words. When the meanings of adjectives are taken into consideration more personal expressions are more frequently used in oral expressions. Some words which are not used at all are found to be in scientific and literary meanings.

To make a general conclusion from the above three tables, among these randomly selected adjectives, the most used adjectives in scientific prose (over 260) were determined as “anlamlı, başlıca, bilimsel, ciddi, çağdaş, doğal, elverişli, güvenilir, gereksiz, geçerli, kalıcı, karmaşık, uyumlu, verimli ”. The most used adjectives (over 174) in non-scientific prose were "ciddi, çağdaş, doğal, dürüst, geçerli, başlıca, baskın, anlamlı uyumlu”. Regarding verbal expression, since there is a limited corpus, the frequently used adjectives (over 30) were determined as "bilimsel, ciddi, doğal, geçerli, harika, sevimsiz”. Based on these findings, it has been inferred that while some words are frequently used in both scientific prose, non-scientific prose and oral expression, some words are used only in oral expression, and some words such as "betimsel, eğitsel, yazınsal, edimsel, bağıntılı, ampirik” are not used in oral expression at all.

Discussion and Conclusion

The data obtained from this study revealed that adjectives existing in the language used in the written scientific context differ in terms of frequency of use in written non-scientific language and spoken language. While some words were used more frequently in scientific prose, the same word was used less in non-scientific prose. Likewise, words that are used with certain frequency in scientific and non-scientific prose but are never used in oral expression have been identified. In this context, based on the findings obtained from the study, it has been revealed that some words are frequently used in all types of contexts, that is, in both written and verbal contexts, while some words are used only in a certain type.

Children first learn the language in the family, and when they start school, they see terms from different fields as well as different uses of the language in the context of style, grammar and word choice. Learning how to use language in different contexts begins with systematic school education and develops through intensive reading and writing experiences. To help students move comfortably between basic communication skills and cognitive academic language competence in their school careers, training modules for the development of their written and oral expression should be offered, as academic language competence is not a competence that develops naturally on its own, it should be seen as a systematic and long-term teaching process for its users (Lin, 2016). Many factors are effective in scientific language use, as in academic success. Individuals with high

academic success can use academic and scientific language more effectively (Spellerberg, 2015).

This study was carried out on a very limited corpus base. Words in different categories in a broader corpus base and in corpora in different languages can be examined in future studies. In addition, this corpus, which existed within a certain period of years, was limited and it could not reflect the whole and current language usage.

References

Aduriz-Bravo, A. Chion, A. R. & Pujalte, A. (2015). Scientific Language. *Encyclopedia of Science Education*, 1-4.

Cummins, J. (1979). Cognitive/Academic Language Proficiency, Linguistic Interdependence, the Optimum Age Question and Some Other Matters. Working Papers on Bilingualism, No. 19.

Doyumğaç, İ. (2022). Yabancı dil olarak Türkçe eğitmenlerinin sınıf yönetiminde karşılaştıkları sorunlar ve çözüm önerileri. *Çocuk Edebiyat ve Dil Eğitimi Dergisi, 5*(2), 179-200.

Gottlieb, M., & Ernst-Slavit, G. (2014). *Academic language in diverse classrooms: Definitions and contexts*. Corwin Press.

Halliday, M. A. K. & Hasan, R. (1976). *Cohesion in English.* London: Longman.

Heath, S. B. (1983). *Ways with Words: Language, life, and work in communities and classrooms.* Cambridge: Cambridge University Press.

Lin, A. (2016). How language varies: Everyday registers and academic registers. Language Across the Curriculum & CLIL in English as an Additional Language (EAL) Contexts, Springer, 11-27.

Mahboob, A. (2014). Language variation and education: A focus on Pakistan. In S. Buschfeld, T. Hoffmann, M. Huber, & A. Kautzsch (Eds.), The evolution of Englishes (Vol. 2, pp. 267–281). Amsterdam: John Benjamins.

Marulanda Ángel, N. L., & Martínez García, J. M. (2017). Improving English language learners' academic writing: A multi-strategy approach to a multidimensional challenge. *GiST Education and Learning Research Journal, 14*, 49-67.

Marulanda Ángel, N.L. & Martínez García, P.M. (2017). Improving english language learners' academic writing: A multi-strategy approach to a multi-dimensional challenge. *Gist Education and Learning Research Journal, 14*, 49-67.

Özkan, B. (2010). Türkçenin öğretiminde sıfatların eşdizim sözlüğü-yöntem ve uygulama. *International journal of educational research, 1* (2), 51-65.

Rao, C. S. (2022). The academic language used in scientific research. *Journal for Research Scholars and Professionals of English Language Teaching, 6*, (29).

Schleppegrell, M. J. (2012) Academic language in teaching and learning introduction to the special issue reviewed work(s), *The Elementary School Journal, 112* (3), 409-418.

Spellerberg, S. M. (2015). Metalinguistic awareness and academic achievement in a linguistically diverse school setting: a study of lower secondary pupils in Denmark. *International Journal of Multilingualism, 13* (1), 19-39.

Tunmer, W. E., & Myhill, M. E. (1984). Metalinguistic awareness and bilingualism. Tunmer, W.C., Pratt, C. and Herriman, M.L. (Ed.) *In Metalinguistic awareness in children: Theory, research, and implications* (pp. 169-187). Berlin, Heidelberg: Springer Berlin Heidelberg.

Young, A. & Fry, J. D. (2008). Metacognitive awareness and academic achievement in college students. *Journal of the Scholarship of Teaching and Learning, 8* (2), 1-10.