

Interactive Metadiscourse Markers in the Turkish Articles on Science and Social Sciences

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Abstract

This study aims to identify the interactive metadiscourse markers in the main sections of the articles (introduction, method, findings, results, discussion and conclusion) in the fields of science and social sciences. Designed as a descriptive research, this study employs the survey model. The articles analyzed in this study are a total of 16 articles, 8 science and 8 social sciences articles selected from the science and social sciences journals at DergiPark. The study group of this paper includes 54,253 words, 16,301 of which are in the articles on science and 37,952 are in the articles on social sciences. To achieve, this study draws on Hyland and Tse's framework of metadiscourse model. The data are analyzed through descriptive analysis method. A Mann-Whitney U test is performed to find out whether there is a significant difference in the use of metadiscourse markers identified in the descriptive analysis of the articles on science and social sciences. The analysis indicate that more interactive metadiscourse markers are used in the articles on social sciences compared to the articles on science; yet, this difference is not significant. Furthermore, the use of code glosses is significant for social sciences; nonetheless, there is no significant difference in the use of other interactive metadiscourse markers.

Keywords: Academic Writing, Metadiscourse, Interactive Metadiscourse, Turkish Scientific Texts

DOI: 10.29329/epasr.2021.373.4

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Introduction

Text is an act between the writer and the reader. Metadiscourse is a concept concerning the relationship and communication between the writer and the reader. This concept was first coined by Harris (1959) and later developed by researchers such as Williams (1981), Vande Kopple (1985) and Crismore (1989) (Hyland, 2005, p. 3). Metadiscourse is defined as non-topic material by Lautamatti (1978), writing about writing by Williams (1981, p. 40), communication about communication by Vande Kopple (1985, p. 83) and discourse about discourse by Hyland (1998, p. 437).

Metadiscourse that contributes to the way a text is understood (Hyland, 2005, p. 23) helps writers create consistent and reader-friendly texts (Mirshamsi and Allami, 2013, p. 23). It is thus emphasized that metadiscourse is about the relationship between the writers who make up the text and the readers who analyze it (Kan, 2016). Metadiscourse has taken on new significance given that it contributes to the creation of consistent and understandable texts, as mentioned above, and serves to establish the relationship between the writers and the readers.

Metadiscourse research has often focused on interdisciplinary comparisons as scientific copywriters from different disciplinary communities are expected to follow different rules in the production and communication of knowledge (Becher & Trowler, 2001; Hyland, 2000 as cited in Cao & Hu, 2014). With these studies, especially inexperienced writers who are candidates to join the discourse community can gain awareness of the metadiscourse markers of scientific texts in different areas. There are some metadiscourse studies that compare science and social sciences, which are two main areas in the literature (e.g. Pooresfahani, Khajavy and Vahidnia, 2012; Zarei and Mansoori, 2011), because studies that compare these two areas by analyzing the interactive metadiscourse markers in all the main sections of Turkish scientific texts are insufficient. Therefore, this study, which compares the articles in science and social sciences, adds to the relevant literature as well as offers insights for metadiscourse studies that compare main areas based on Turkish scientific texts.

Metadiscourse Markers

Vande Kopple proposed his pioneering metadiscourse model first in 1985 and developed it by 2002. In the following years, researchers such as Crismore (1989), Bunton, (1999), Hyland and Tse (2004), Ädel (2006) presented new models to the literature. Among the aforementioned models, Hyland and Tse's model features two basic dimensions: interactional and interactive. The interactional dimension, which determines the level of personality in the text, shows the ways the writer manages the interaction; the purpose of the writer here is to explain his/her opinion and involve the reader in the text (Hyland, 2005, p. 49, 52). It includes hedges, boosters, attitude markers, engagement markers, self-mentions.

The interactive dimension, which shapes the text considering the reader needs, explains the ways in which the writer is aware of the reader involvement and regulates the reader's possible knowledge, interest, rhetorical expectations, and processing abilities (Hyland, 2005, p. 49). It includes transitions, frame markers, endophoric markers, evidential markers and code glosses. These interactive metadiscourse markers are discussed below with examples from the articles analyzed in this study.

Transitions

Transitions help readers interpret pragmatic connections and signal causative and contrastive relations in the writer's thinking, expressing relationships between stretches of discourse (Hyland, 2005, p. 50). Transitions are words such as "also, moreover, but, however, thus, and, even, therefore, already, thereby, because" and phrases such as "on the other hand, that being said, even though, moreover, in addition to." Examples are as follows:

Pear can be grown in almost all regions in the world where apple can be grown. **However**, pears are less resistant to cold than apples, which allows pears to be grown even in the regions at the 55th degree of north latitude. (Food science and technology)

It was found in the univariate model that sex and short stature had a significant effect on the differentiation of patients with normal and non-normal vitamin B12 levels ($p < 0.05$). **Moreover**, family history, age at diagnosis, duration of disease, current age, body weight, mobility, and type were analyzed and they were not found effective ($p > 0.05$). (Medicine)

Among crimes against sexual immunity, sexual abuse is the most difficult crime to detect **and** appears to be an important problem that affects the individual, family and society as a whole, regardless of gender, race, social or ethnic origin. (Law)

Increasing the rate of literacy especially among the women and children population was one of the most important priorities for the new Republic that took over from the Ottoman Empire. **Because** modernization at that time was something that could only be possible in this way. (Art)

Frame Markers

Frame markers signal elements of schematic text structure or text boundaries, helping readers understand the discourse more clearly (Hyland, 2005, p. 51). Frame markers are words such as "study, paper, then, briefly, to summarize, to highlight, to seek" or phrases such as "this study, this paper, first of all, in this sense, in this context, in this framework, in this section, in section X, the purpose of this study, the purpose of this paper." Examples are as follows:

In this study, the quantitative status as well as the spatial and vertical distribution of the present stock of mesozooplankton in the Turkish Straits System were determined, which hopefully helps us understand the ecological processes in the pelagic ecosystem in the region. (Environmental sciences)

This paper molecularly investigated whether T. foetus is among the chronic diarrhea factors in cats and identified the risk factors of infection. (Veterinary medicine)

The term "traditional" is used as the opposite of modern. **In this context**, modernization refers to the transition from traditional society to modern society. (Public administration)

The other concept that **this study focused on**, temperament, is the expression of the bodily aspect of the human being, and although it provides explanations about the biological side of a person, it mostly indicates the predispositions of the person and her/his own character structure. (Science of religion)

Endophoric Markers

Endophoric markers are expressions which refer to the other parts of the text and thus make additional ideational material salient and available to the reader in aiding the recovery of the writer's meanings, often facilitating comprehension and supporting arguments by referring to earlier material or anticipating something yet to come (Hyland, 2005, p. 51). Endophoric markers are words such as "noted, mentioned, see, table, figure, below, following, above, aforementioned" or phrases such as "noted above, mentioned below, as seen, as given in Table X." Examples are as follows:

As given **in Figure 2**, the placement of longitudinal and transverse reinforcements in rectangular cross-section reinforced concrete columns, the change of transverse reinforcement intervals and column dimensions. (Engineering)

Table 1 shows the observations and measurements made in 50 Festuca valesiaca genotypes. (Agriculture)

This idea, **as mentioned above**, caused two world wars in the century XX. (Humanities)

The changes and developments that are explained **above** and constitute the main problem of the research also affect the accommodation businesses, which are the backbone of the tourism sector. (Hotel management, accommodation, sports and tourism)

Evidentials

Evidentials, which are metalinguistic representations of an idea from another source, guide the reader's interpretation and establish an authorial command of the subject, thus involve hearsay or

attribution to a reliable source (Hyland, 2005, p. 51). Evidentials are uses such as “according to X; X defines/explains/states; X, year.” Examples are as follows:

Abdel-Wahed and Snyder (2015) estimated the sunshine duration using monthly average temperature, relative humidity and wind speed data. (Common disciplines)

Önal and et al.²¹ investigated serum B12 levels in 250 pregnant women and their newborn babies in Istanbul and found that 81.6% of the mothers and 42% of their babies had B12 deficiency. (Medicine)

In order to prevent the damages caused by natural flood waves in the Basin Oder, storage pools and other hydro-technical infrastructures that play a role in directing the flood waters and reducing the maximum discharge were built (**Dubicki et al., 2005**). (Humanities, common disciplines)

The communication, interaction and data exchange of different devices with each other created various needs in terms of privacy, security and usability, which are the three elements of information security (**McCumber, 1991**). (Education, educational research)

Code Glosses

Code glosses provide additional information by rephrasing, explaining or elaborating what was said to ensure that the reader is able to recover the writer’s intended meaning (Hyland, 2005, p. 52). Code glosses are words such as “e.g., namely” or phrases such as “in other words, that is.” Examples are as follows:

In Model 2, the volume reduction of the transverse reinforcement used in the confinement zone by 0.10% did not change the carrying capacity of the column shear force much, but it had an effect especially on the lateral displacement amounts. **That is to say**, 162 kN, which is the largest shear force that columns can carry for Model 1 and Model 2, created 15.54 mm lateral displacement in Model 1 and 18.27 mm in Model 2. (Engineering)

In this study, the average activation energy value required during the thermal decomposition of the hydroxyapatite crystals produced in the presence of pure and 1000 ppm pentanoic acid was calculated in the temperature range of 700-900 oC, **namely** using the Kissinger model in the main decomposition zone. (Basic sciences)

The origin of the understanding of "being in the middle", **in other words**, "moderation" in this order, goes back to Galen, one of the first thinkers who put forward systematic ideas about temperament. (Science of religion)

Today, the first thing that comes to mind about political order is the Western-style political order in the literature and this is used as such. **That is**, when one asks which political order, the answer is always the Western one. (Public administration)

This study aims to identify the interactive metadiscourse markers in all the main sections of the Turkish articles (introduction, method, findings, results, discussion and conclusion) in the fields of science and social sciences. Accordingly, the sub-purposes of this study are as follows:

- To identify the frequency of interactive meta-discourse elements,
- To determine whether there is a significant difference in the use of interactive meta-discourse elements depending on different areas in all the main sections of articles in social sciences and science.

Method

Designed as a descriptive research, this study employs the survey model. The reason for choosing the survey model within descriptive research is that this study seeks to identify the interactive metadiscourse markers in the articles on science and social sciences. Since survey models are research approaches that aim to describe a past or present situation as it exists (Karasar, 2012).

Data Collection

The articles analyzed in this study were a total of 16 articles, 8 science and 8 social sciences articles selected from the science and social sciences journals at <https://dergipark.org.tr/tr/>. The study group of this paper, which examines the main sections of these articles (introduction, method, findings, results, discussion and conclusion), included 54,253 words, 16,301 of which were in the articles on science and 37,952 were in the articles on social sciences.

There are two main fields, science and social sciences, on the website of DergiPark (<https://dergipark.org.tr/tr/>). The sub-fields of science consist of “environmental sciences; food science and technology; engineering; common disciplines; basic sciences; medicine; veterinary medicine; agriculture” whereas the sub-fields of social sciences consist of “humanities, common disciplines; the science of religion; education, educational research; law; public administration; hotel management, accommodation, sports and tourism; art; political sciences.”

A filtered search was performed in the sub-fields mentioned above on 23.07.2020. The studies were scanned through the filters of Category (Article), Primary Language (Turkish) and The Publisher Type (University). As a result of this filtered search, the Turkish article on the relevant sub-field which was published in last issue of the first journal of 2020 was included in this study.

Data Analysis

The analysis in this study drew on the metadiscourse model proposed by Hyland and Tse (2004). The model in question was limited to the use of metadiscourse markers for this study. The data were analyzed through descriptive analysis method.

Because the data have non-parametric properties, this study performed a Mann-Whitney U test to find out whether there was a significant difference in the use of metadiscourse markers identified in the descriptive analysis in the articles on science and social sciences. All words in the main sections of the identified articles were analyzed. Furthermore, as the number of words in the articles in the fields of science and social sciences was not the same, the metadiscourse markers are also presented items per 1000 words, and the Mann-Whitney U test was performed based on these data.

Expert review (see. Merriam, 2009) was conducted to enhance the credibility of this research. To that end, an evaluation meeting was held with an expert lecturer specialized in the field of text linguistics. After the expert was informed about the research process, a consensus was reached on all the data obtained from the analyses of the articles.

Results

Table 1 indicates the frequency of interactive metadiscourse markers in the Turkish articles on science and social sciences and their rate of incidence per 1,000 words.

Table 1. Interactive Metadiscourse Markers in The Articles on Science and Social Sciences

Interactive Metadiscourse Markers	Science		Social Sciences	
	f	Items per 1000 Words	f	Items per 1000 Words
Transitions	170	10.43	533	14.04
Frame Markers	64	3.93	110	2.90
Endophoric Markers	88	5.40	119	3.14
Evidentials	173	10.61	443	11.67
Code Glosses	22	1.35	188	4.95
Total	517	31.72	1393	36.70

Table 1 shows that 517 interactive metadiscourse markers were used in the research articles on science whereas the number of interactive metadiscourse markers in the research articles on social sciences were 1393. Moreover, more interactive metadiscourse markers were used in the articles on social sciences, in terms of items per 1000 words when compared to the articles on science.

As given in Table 1, the most common interactive metadiscourse markers in the research articles in the field of science were evidentials and transitions, respectively. On the other hand, the most common markers in the articles on social sciences were transitions and evidentials, respectively, in terms of items per 1000 words. The least used interactive metadiscourse markers were code glosses

in the articles on science and frame markers in the articles on social sciences in terms of items per 1000 words.

This study also performed a Mann-Whitney U test to find out whether there was a significant difference in the use of metadiscourse markers identified in the descriptive analysis of the articles on science and social sciences. Table 2 presents the results of this test.

Table 2. The Mann-Whitney U Test on The Interactive Metadiscourse Markers in Science and Social Sciences Articles

	Transitions	Frame Markers	Endophoric Markers	Evidentials	Code Glosses	Total
Mann-Whitney U	24.000	21.000	20.000	25.000	4.000	26.000
Wilcoxon W	60.000	57.000	56.000	61.000	40.000	62000
Asymp. Sig. (2-tailed)	.401	.248	.208	.462	.003	.529

*: $p < 0.05$

Table 2 demonstrates that there was not a significant difference between the articles on science and social sciences regarding the total use of interactive metadiscourse markers in terms of items per 1000 words. Yet, there was a significant difference in the use of code glosses for the articles on social sciences. It was revealed that there was not any significant difference in the use of other interactive metadiscourse markers.

Discussion, Conclusion and Recommendations

This study analyzed the use of interactive metadiscourse in the articles on science and social sciences. It concluded that 517 interactive metadiscourse markers were used in the research articles on science whereas the number of interactive metadiscourse markers in the research articles on social sciences were 1393. Further, more interactive metadiscourse markers were used in the articles on social sciences, compared to the articles on science, in terms of items per 1000 words (36.70; 31.72, respectively); yet, this difference was not found significant. This implies that the authors of the articles on both fields seem to guide the readers through the text (Hyland and Tse, 2004). Similarly, other studies in the literature (Ünsal, 2008; Zarai, 2011) ascertained that more interactive metadiscourse markers were used in the articles on social sciences, relative to those on science.

It was discovered that transitions were the most common interactive metadiscourse marker in terms of items per 1000 words in the articles on social sciences and the second most common interactive metadiscourse marker in the articles on science following the use of evidentials. Yet, the Mann-Whitney U test demonstrated that there was not a significant difference in the use of transitions in these two fields. Considering the role of transitions in helping readers interpret the connection between thoughts (Hyland, 2005, p. 50), the writers in both fields seemed to help readers understand the text more easily – more in the articles on social sciences, without a significant difference between the fields. The study by Zarai (2001) on interactive metadiscourse markers in the articles on science

and social sciences revealed that the articles in both fields used transitions the most and that even though the articles on social sciences benefited from transitions more, there was not a significant difference between the use of transitions in the two fields. Another relevant study, which was conducted by Ünsal (2008) on the English articles on science and social sciences, ascertained that the most commonly used interactive metadiscourse markers in both fields were transitions and transitions were used in social sciences more. The frequent use of transitions identified both in this study and in the mentioned studies in the literature supports the argument by Hyland and Tse (2004) that the high use of transitions is clearly an important feature of academic writing.

It was found that evidentials were the most commonly used markers in the articles on science in terms of items per 1000 words and the second most commonly used markers in the articles on social sciences following the use of transitions. Yet, the Mann-Whitney U test revealed no significant difference between the two fields in terms of evidentials. Given that evidentials increase the reliability of the information in the discourse by showing the responsible source of that information based on citations (Hyland, 2005, p. 51), the writers in both fields made an effort to enhance the reliability of their articles – through the frequent use of evidentials. Similarly, other studies in the literature (Ünsal, 2008; Zarai, 2011) demonstrated that evidentials are used in the articles on social sciences more, compared to the articles on science.

Code glosses were the least used markers in the articles on science in terms of items per 1000 words and the third most commonly used markers in the articles on social sciences. Yet, the Mann-Whitney U test revealed no significant difference between the fields in terms of code glosses. Considering that code glosses provide additional information to the readers (Hyland, 2005, p. 52), the writers in social sciences helped their readers more in this regard. Likewise, other studies in the literature (Ünsal, 2008; Zarai, 2011) highlighted that code glosses were used in the articles on social sciences more compared to the articles on science and they were the least used interactive metadiscourse markers in the articles on science.

Frame markers were the least used markers in the articles on science and the second least used markers in the articles on social sciences; however, this was not a significant difference. Given that frame markers signal elements of schematic text structure and makes the discourse clear to the readers (Hyland, 2005, p. 51), the writers in both fields made approximately the same amount of effort to allow the readers to understand and follow the text more easily. Asghar (2015) stated that frame markers help readers understand the structure of the text and the text will become more difficult to read in the absence of frame markers. Likewise, Zarai (2011) and Ünsal (2008) determined that frame markers are more used in the articles on science compared to those on social sciences.

Endophoric markers were less used in both fields compared to transitions and evidentials. Although relatively more endophoric markers were used in terms of items per 1000 words in the field

of science compared to social sciences, this difference was not significant. Considering that endophoric markers allow the text to be read both univocally and linearly as they refer to the text itself or parts of the text (Uzun, 2006, p. 138), the writers of the articles on science tried to guide the readers to understand the text and read it linearly – albeit without statistically significant difference. Similar to this study, studies in the literature (Ünsal, 2008; Zarai, 2011) reported that endophoric markers were not among the two most common metadiscourse markers and they were used in the articles on science more compared to those on social sciences.

This study examined the Turkish articles in the fields of science and social sciences in relation to the use of interactive metadiscourse markers. Further studies may analyze different types of scientific texts such as master's theses and doctoral dissertations written in Turkish and compare them with existing studies, offering insights into Turkish scientific texts and thus adding to the literature.

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