



A Corpus-Based Cross-Disciplinary Analysis of “Objectivity” Manifestations in Academic Texts

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Abstract

This study aimed at investigating the manifestations of objectivity in American academic texts across different disciplines and various time spans. To achieve this, the Corpus of Contemporary American English (COCA) was surveyed in terms of the frequency of occurrence of the four identified linguistic features (i.e., passive voice, impersonality, hedging, and attitude markers) as the indicators of objectivity (e.g., Alvin, 2014; Bal-Gezegin & Baş, 2020) to find the cross-disciplinary differences during the last twenty years. The results indicated that passive voice was employed differently across the academic disciplines of COCA and the notion of impersonality was more realized in hard sciences in comparison to soft ones. Moreover, the findings revealed a decline in the occurrence of passive voice through time in all the academic disciplines. In addition, hedging and attitude markers were more manifested in hard sciences probably due to the writers' inclination to be judged objectively. Finally, objectivity was shown to have a steady increase in American academic texts implying that, though the authors of academic texts revealed less inclination to employ passive voice to avoid difficulty and ambiguity, they have employed less personal authorial references to stick to the notion of objectivity and impartiality during the recent years.

Keywords: academic texts, objectivity manifestations, corpus-based analysis, cross-disciplinary investigation, corpus of contemporary American English (COCA)

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Introduction

Writing specialized texts has been considered as a challenging issue needing specific experts in each specialized domain (Cunha & Montané, 2019) since conveyance of knowledge in academic texts is of great importance that should be fulfilled via the employment of the appropriate register different from the everyday language which is mainly considered as personal, biased, and emotive. In other words, academic writing demands a formal discourse that should not be influenced by emotive language (Pagliawan, 2017). Hence, moving from the personal language to the objective language used by scholars has been considered as one of the important issues in writing academically (McArthur, 1992; Šimanskienė, 2005). In effect, for maintaining objectivity in scientific research studies, academic writers should make use of unbiased and impersonal language with a minimum amount of their personal preferences to detach themselves from their findings (Hyland, 2002).

Accordingly, the notion of “objectivity”, which has been perceived as being impartial or not prejudiced, making use of reason and logic in concluding (Baise, 2020), has been regarded as one of the most common and distinctive features of academic writing (Pagliawan, 2017; Samigullina, 2018; Šimanskienė, 2005) as well as the most valued principles of educational research (Eisner, 1992). As a matter of fact, depending on the context, various senses of objectivity have been represented differently and recognized as conceptually distinct (Eisner, 1992; Koskinen, 2020). Therefore, the nature of objectivity as a concept having no single sense to be captured clearly has been declared to be “a value that academics strive for but never fully achieve, something that comes in degrees” (Nunn, Brandt & Deveci, 2018, p. 75).

Through a comprehensive review of the literature four main linguistic indicators of *passive voice* and *impersonality*, *hedging* and *attitude markers* were considered as the instruments of objectivity manifestations in academic texts. *Passive voice* was focused on by Alvin (2014), Atkinson (1996), Chang, Luo and Hsu (2012), and Ding (2002) as the indicator of objectivity while *impersonality* was regarded as the pointer to objectivity by Dumin (2010), Hyland (2002), and Rundbald (2007) and *hedging* and *attitude markers* were held as the cursers of impartiality in academic texts by Bal-Gezegin and Baş (2020), Demir (2018), Duruk, (2017), Harmon (1992), Hyland (2002), Rodman (1994), and Seoane (2013). However, academic writings cannot be treated “as a single, monolithic discourse” (Šimanskienė, 2005, p. 8). This study benefitting from a wider viewpoint, and believing in the relativity of “objectivity” in various disciplines (Nunn, Brandt & Deveci, 2018), has tried integrating all these linguistic features to scrutinize the notion of objectivity across nine disciplines of education, history, geography / social sciences, law / political sciences, humanities, philosophy / religion, science / technology, medicine and business, in American academic texts, as the most dominant academic texts (Baise, 2020), focusing on its manifestation over the recent 20 years. Consequently, the following research questions were formed:

- How is the concept of objectivity manifested in American academic texts of different disciplines?

- How is the notion of objectivity realized in American academic texts through the last 20 years?

Literature Review

Linguistic Indicators of Objectivity

Recently, the meticulous analysis of the academic discourse has been a heated theme of research (e. g., Alvin, 2014; Baise, 2020; Demir, 2018; Egbert & Baker, 2021; Elheky, 2018; Khaghaninejad et al., 2021) in which “objectivity” is recognized as a determining feature of academic discourse, differentiates it from other prejudiced, manipulated, and subjective discourses. However, different linguistic indicators are introduced as the instances of the academic texts’ objectivity (e.g., Alvin, 2014; Baratta, 2009; Cigankova, 2016; Ding, 2002; Williams, 2005;), many studies (e.g., Abuelwafa, 2021; Cunha & Montane, 2019; Subagio et al., 2019; Zhang & Schwarz, 2020) tried to accumulate the dispersed findings and provide a framework for analyzing the texts’ objectivity. These studies referred to *passive structures*, *impersonality*, *hedging*, and *attitude markers* as the most salient indicators of objective academic discourse unanimously.

Consequently, the most frequent manifestations of these four linguistics features (including 22 indicators all together) are chosen for evaluating the objectivity manifestation in American academic discourse – the most dominant academic discourse of the world (Demir, 2018). In the following, the conducted studies on these linguistic indicators are reviewed and, additionally, a brief description of American discourse is provided.

Passive voice has been employed by academic writers to foster the impersonal and objective tone of academic texts (Baratta, 2009). Researchers advocated the use of *passive voice* in scientific texts which have yielded different reasons in this regard. Ding (2002) considered *passive voice* as the most prevalent characteristic of the scientific texts and referred to “falsifiability of science and cooperation among scientists” (p. 137). He came to the point that the use of *passive voice* in academic texts makes the authors more “thing-centered” than human-oriented, which helps them highlight their professionalism rather than their personal viewpoints, and makes their “common knowledge base” available to all (p. 150). Likewise, Shaw (2003) studied the *passive voice* of academic discourses in astrophysics journals and referred to the fact that “the passive seems to be used when the authors are simply following a established or standard procedure, as in using accepted equations” (p. 135). Williams (2005) also advocated the use of *passive voice* in scientific writing since from his point of view it is a standard and useful way of transferring ideas in scientific texts.

Rundbald (2007) also referred to the fact that *impersonality* could empower writers to “signal credibility, reliability, objectivity, and ultimately authority to their readers and the research community” (p. 251). Pagliawan (2017) also declared that academic texts require formal language including an impersonal presentation of

ideas using words such as “the researcher, the writer, or the author” instead of using personal pronouns referring directly to the writers themselves. The concept of *hedging* or cautious language was first introduced and defined by Lakoff (1973) as “words whose job is to make things fuzzier or less fuzzy” (p. 471). Indeed, through expressing tentativeness and possibility, *hedging* was considered as the key feature in academic writing (Crompton, 1997; Hyland, 2002) showing the weakening of writers’ claims and suggesting “that a statement is based on plausible reasoning rather than certain knowledge” (Hyland, 2002, p. 353). Moreover, writers not only need to provide a balance between the collected data and the interpretation of the results as accurately and objectively as possible but also are required to take their own stance and “this can be achieved through the effective use of hedging which provides expressiveness and credibility” (Gherdan, 2019, p. 123). Furthermore, the writers’ use of *hedging*, which shows their own stance and academic modesty towards the texts (Baratta, 2009), functions as a face-saving act strengthening their argument (Chang, Luo & Hsu, 2012). However, hedges should be employed moderately and cautiously since their overuse would lead to the incredibility of writers’ statements and counter-productive consequences (Demir, 2018) due to their polysemous nature (Alonso et al., 2012).

Attitude markers which are defined as markers that “express writers’ affective values – their attitudes towards the propositional content and/or readers rather than a commitment to the truth-value” (Cigankova, 2016, p. 58), were identified as the writers’ affective stance to propositions (Bal-Gezegin & Baş, 2020; Hyland, 2005) leading to the subjectivity of the texts (Hyland, 2005). Based on Dueñas’ (2010) declaration, “the inclusion of attitudinal markers can contribute to displaying a personal stance, indicating the writer’s judgments, views, and opinions, which need to be expressed in accordance with the value system of the particular community they address” (p. 51). In effect, by employing *attitude markers*, the writers of academic research articles show their control over the interpretation of the proposed ideas in the texts (Blagojević, 2009), and “express their perspective or evaluation of the propositional content subjectively” (Dুরুk, 2017, p. 3).

Academic Discourse

A noticeable number of studies have investigated the academic discourse. For example, some researchers (e.g., Atkinson, 1996; Harmon, 1992; Rodman, 1994) have provided empirical evidence regarding the widespread use of *passive voice* in scientific texts by conducting corpus-based studies on a number of academic articles. Likewise, by analyzing 90 medical papers, Amdur, Kirwan and Morris (2010) reported large percentages for the employment of *passive voice* in the intended articles, the main reason of which was revealed to support “objectivity” and neutrality. Similarly, Millar et al. (2013) explored the use of *passive voice* in 297 research papers by analyzing the mean frequency of passives per sentence and indicated that about half of the sentences were written in passives. In another study, Alvin (2014) investigated the proportion and prevalent forms of the employed passives in these articles and the contexts in which they mainly occurred. The results

indicated that about 30% of the clauses included passives, which were mainly found in the form of basic and bare passives. The study, hence, highlighted the fact that passive sentences were largely employed in scientific texts specifically in their methodology sections.

In the same vein, there have been several empirical studies exploring the concept of *impersonality* in academic contexts from different perspectives. For example, by focusing on a cross-cultural approach, Molino (2010) explored comparatively the corpora of 60 single-authored English and Italian articles to analyze the interpersonal aspect of academic writing which was supposed to be manifested via the employment of personal and impersonal authorial references. The results indicated that various occurrences of personal and impersonal authorial references across the two discourse communities could be related to different subjective or objective interpersonal strategies employed in the intended communities as well as different discourse functions which were focused on. In another study, Vergaro (2011) investigated the rhetorical stance in the academic writing of Italian students of English by considering the employment of first-person pronouns (both singular and plural) and came to the point that in terms of the broader social, cultural and educational factors existing behind the intended writing practices of the study, pluralization was the prevalent strategy used by the writers to deemphasize the agentic role of the subjects, which implied a sense of detachment and *impersonality* as an important characteristic of Italian academic writing. Ghafar Samar and Amini (2015) also conducted a study to compare the employment of personal and impersonal metadiscourse by Persian and English-speaking writers. Through analyzing 80 abstracts chosen from endocrinology and metabolism journals, they found that impersonal metadiscourse was used more by Persian-speaking writers since they preferred to show their presence more indirectly while personal metadiscourse was employed more by English-speaking writers since they preferred to indicate their position more vividly.

With respect to the employment of *hedging* in academic texts, the results of different empirical cross-disciplinary studies from various standpoints denoted to the writers' detachment from propositions (Vassileva, 2001), expressed their subjective stance while supporting their claims in soft sciences in comparison with hard sciences (Chang, Luo & Hsu, 2012), and suggested that the nature of the knowledge in each discipline affected their use (e.g., Elheky, 2018; Sameri & Tavangar, 2013). Thus, due to the interpretive nature of soft sciences, the rate of using hedges was higher (Hyland, 2005) since "researchers in soft sciences may not be able to show the same confidence as researchers of hard sciences" (Vázquez & Giner, 2008, p. 179). In contrast, a few studies reported that the factor of discipline did not have any influence on the use of hedges in academic texts (e.g., He & Wang, 2012; Lafuente-Millán, 2008; Sanjaya, 2013). Furthermore, through corpus analysis, diverse studies were conducted on L2 learners' difficulty in understanding and using hedges correctly (e.g., Hyland, 2002; Kim & Lim, 2015), ESL books' differences in terms of the quality and quantity of using hedges (e.g., Sanjaya, 2013), and native and

non-native writers' differences across different disciplines in using hedges (e.g., Demir, 2018; Sameri & Tavangar, 2013; Vassileva, 2001).

Attitude markers have been widely studied based on corpus-driven approaches across different disciplines (e.g., Hyland & Tse, 2005; Khedri, Ebrahimi & Chan, 2013) and from various cross-linguistic (e.g., Afshar Mameghani & Ebrahimi, 2017; Boshraadi et al., 2014) as well as cross-cultural (e.g., Dueñas, 2010) perspectives indicating the scholars' viewpoints and stances in clarifying and enhancing the evaluation of the texts (Sorayyaei Azar & Hashim, 2019). Moreover, *attitude markers* are important devices for writers' interpretation and argument and the nature of disciplines affects their use (Hyland & Tse, 2005). As such, "the soft sciences express 'far more explicitly personal stance' compared to the hard sciences" (Bednarek, 2008, p. 210), are more interpretive, and rely more on the writers' arguments and attitudes (Hyland, 2005). Accordingly, different studies on academic research articles across different disciplines reported that soft disciplines used more *attitude markers* in comparison with hard disciplines (e.g., Dueñas, 2010; Hyland, 2002; 2005). However, "the inclusion of attitude markers in academic writing is discipline-driven and also genre-driven" (Dueñas, 2010, p. 51).

Although the four aforementioned linguistic features in academic texts have been investigated separately in different theoretical and corpus-based empirical studies from various perspectives, little research has been conducted to explore the intermingling of such features across different disciplines and time spans in one single study examining the trend in their employment in academic texts. Hence, it tried to present a more comprehensive picture of objectivity in American academic texts by scrutinizing the manifestation of these linguistic features across different disciplines and through a 20-year time span.

Method

This research is a corpus-based study employing the Corpus of Contemporary American English (COCA) to obtain the necessary data for focusing on the frequency of occurrence of the objectivity indicators such as *passive voice*, *impersonality*, *hedging*, and *attitude markers* in American academic texts across nine academic disciplines of COCA, namely, education, history, geography / social sciences, law / political sciences, humanities, philosophy / religion, science / technology, medicine, and business through the recent 20 years. The rationale for using COCA was that it is the largest as well as the most widely-used genre-based corpus of American English containing more than one billion words in various cross-disciplinary texts, which provides the researchers with both more reliable information and the frequencies of linguistic items from 1990 to 2019 (Demir, 2018). It is worth mentioning that the academic genre of COCA (comprising a corpus of about 200 million words) offers the discourse of nearly all academic disciplines. This makes this corpus very suitable for the studies which scrutinize the representation or realization of different notions in special genres and sub-genres.

COCA is one of the most popular, balanced corpora with eight genres and about 75 sub-genres sorted in five-year time spans. For evaluating the manifestation of a concept in huge corpora, the occurrence of some linguistic indicators (usually the most frequent ones) should be regarded as the realization of that concept (Baise, 2020). Hence, the frequency of 22 linguistic indicators (6 indicators for *passive voice*, 6 indicators for *impersonality*, 5 features as the indicators of *hedging markers*, and 5 terms as the indicators of *attitude markers*) which were the most frequent features for each aspect of objectivity (statistical significance is also approved online in english-corpora.org), were determined and analyzed.

Data Collection Procedure

In order to investigate the manifestation of objectivity and based on what is done to evaluate huge corpora in literature (e.g., Bal-Gezegin & Baş, 2020; Harwood, 2005; Molino, 2010; Pagliawan, 2017; Vergaro, 2011; Khodadady, Alavi & Khaghaninezhad, 2012), the researchers analyzed the manifestation of 22 linguistic indicators (i.e., “is + pp”, “are + pp”, “was + pp”, “were + pp”, “has been + pp” and “have been + pp” for passive structures, “I”, “we”, “my”, “our”, “the writer” and “the researcher” for personal and impersonal authorial references, “may”, “might”, “probably”, “possibly”, and “perhaps” as *hedges*, and “essentially”, “remarkably”, “surprisingly”, “importantly”, and “interestingly” as *attitude markers*) representing the four identified aspects of objectivity in American academic discourse. These 22 linguistic features were statistically found to be the appropriate indicators for the *passive voice*, *impersonality*, *hedging*, and *attitude markers* as the four aspects of objectivity (COCA demonstrates the statistical significance of occurrence via MI score for the target words’ queries).

To make the investigation of large corpora feasible, focusing on the linguistic indicators connected to the aimed notions is widely practiced recently in many studies (e.g., Cunha & Montane, 2019; Baise, 2020; Elheky, 2018). The occurrence of these meaningfully related indicators to the aimed concepts then would be analyzed and the possible conclusions would be drawn. Accordingly, the occurrence of 22 linguistic indicators (attested by COCA to be statistically meaningful representatives for objectivity manifestations) was scrutinized across different academic disciplines and through different time spans. Finally, being informed by Becher’s (1989) taxonomy of disciplines, researchers interpreted the results based on soft and hard disciplines.

Result and Discussion

Results

In order to specify the manifestation of “objectivity” in American academic texts, the researchers focused on the realization of *passive voice*, *impersonality*, *hedging* and *attitude markers* across the nine disciplines. In the following, the frequencies of the identified indicators are depicted.

Table 1
Frequencies of Passive Verbs Across Different Academic Disciplines

	Is + pp	Are + pp	Was + pp	Were + pp	Has Been + pp	Have Been + pp	Total
Education	21663	30508	33592	43479	6864	6727	142833
History	17601	12953	28701	23258	6284	6675	95472
Geography / Social Sciences	26805	38206	70175	58348	8882	5146	207562
Law / Political Sciences	17802	26432	19718	10232	6491	5324	85999
Humanities	18213	33738	24419	14344	4778	6178	101670
Philosophy / Religion	16212	10819	13903	11664	2406	2849	57853
Science / Technology	36611	46023	44875	37399	9819	9781	184508
Medicine	21913	15317	45456	48092	6603	6524	143905
Business	2245	1839	1211	1147	448	166	7056

As discernible in Table 1, geography / social sciences ($n = 207562$) include the greatest number of passive verbs. Next, science / technology ($n = 184508$) and medicine ($n = 143905$) display more frequent employment of passive verbs as compared to other disciplines. However, business ($n = 7056$) and philosophy / religion ($n = 57853$) indicate the lowest frequency of occurrence of passive verbs in comparison with other disciplines. Regarding the *impersonality*, Table 2 indicates the frequencies of the most typically employed personal and impersonal authorial references across the intended disciplines.

Table 2
Frequencies of Personal / Impersonal Authorial References Across Different Academic Disciplines

	I	We	My	Our	Total of Personal Authorial References	The Writer	The Researcher	Total of Impersonal Authorial References
Education	29383	34142	9823	17038	90386	220	1061	1281
History	18570	18708	6390	10864	54532	187	79	266
Geography / Social Sciences	32795	37091	11794	15667	97347	83	675	758
Law / Political Sciences	17663	24325	4112	10502	56602	17	18	35
Humanities	49644	34011	16073	15879	115607	825	72	897
Philosophy / Religion	22913	27970	8257	15754	74894	72	120	192
Science / Technology	11925	44146	5524	16993	78588	21	124	145
Medicine	3655	26345	1789	11978	43767	4	131	135
Business	913	2993	281	1193	5380	1	45	46

As shown in Table 2, personal authorial references (i.e., “I”, “we”, “my” and “our”) have the highest frequency of occurrence in humanities ($n = 115607$). After humanities, geography / social sciences ($n = 97347$) and education ($n = 90386$) are the disciplines which represent the greater employment of personal authorial references as compared to other included academic disciplines. It is also revealed that personal authorial references have the lowest frequency of occurrence in medicine ($n = 43767$) and business ($n = 5380$). However, considering the intended impersonal authorial references (i.e., “the writer” and “the researcher”), education ($n = 1281$) reveals the most frequent employment of these references as compared to other disciplines. Table 3 illustrates the frequency of occurrence of the most commonly employed words representing *hedges* across the studied disciplines.

Table 3
Frequencies of Hedging Markers Across Academic Disciplines

	May	Might	Probably	Possibly	Perhaps	Total
Education	27531	8047	1116	533	2473	39700
History	11017	6491	1897	632	3402	23439
Geography / Social Sciences	33092	9596	2408	988	4473	50557
Law / Political Sciences	18960	7067	1617	497	2896	31037
Humanities	17229	10076	2424	806	5561	36096
Philosophy / Religion	10457	5105	792	410	2507	19271
Science / Technology	23255	6556	2463	873	2742	35889
Medicine	19666	4523	1128	611	782	26710
Business	1615	332	64	42	106	2159

Table 3 indicates that among the intended academic disciplines, geography / social science ($n = 50557$) incorporates the highest number of *hedging* markers. Next, education (39700) and humanities ($n = 36096$) reveal a greater frequency of occurrence of *hedges* in comparison with other disciplines. However, it is shown that business ($n = 2159$) and religion ($n = 19271$) employ the words representing *hedging* less than other disciplinary fields. Table 4 indicates the frequencies of the most typically employed *attitude markers* across the intended fields.

Table 4
Frequencies of Attitude Markers Across Academic Disciplines

	Essentially	Remarkably	Surprisingly	Importantly	Interestingly	Total
Education	461	105	325	13501	1419	15811
History	783	224	402	8591	798	10798
Geography / Social Sciences	832	266	609	15473	1639	18819
Law / Political Sciences	937	189	312	7007	743	9188
Humanities	877	278	404	8571	1634	11764
Philosophy / Religion	621	99	193	4137	641	5691
Science / Technology	924	287	440	10194	1532	13377
Medicine	276	74	152	6155	443	7100
Business	64	10	31	812	101	1018

As Table 4 illustrates, *attitude markers* have the greatest frequency of occurrence in geography / social sciences ($n = 18819$) among the nine intended disciplines. The second field which reveals the great employment of *attitude markers* is education ($n = 15811$). However, it is displayed that business ($n = 1018$), medicine ($n = 7100$), and law / political sciences ($n = 9188$) employ *attitude markers* less than other academic fields.

After calculating the general frequencies of the intended linguistic indicators of objectivity across different genres, a chi-square test has been employed to evaluate the significance of the observed differences in this regard. The results are shown to be significant, $\chi^2(8) = 1418.000$, $n = 8$, $p < .05$, suggesting that the difference regarding the employment of the linguistic indicators of objectivity across various genres was statistically significant. In other words, diverse academic sub-genres have been found to be meaningfully different in terms of the objective expression.

Table 5
Comparing the Frequency of Objectivity Manifestations Across Different Academic Disciplines

	Value	df	Asymp. Sig (two-tailed)
Pearson Chi-Square	1418.000 ^a	8	.001
Likelihood Ratio	987.000	8	.213
Linear-by-Linear Association	76.000	8	.007
N of Valid Cases	8		

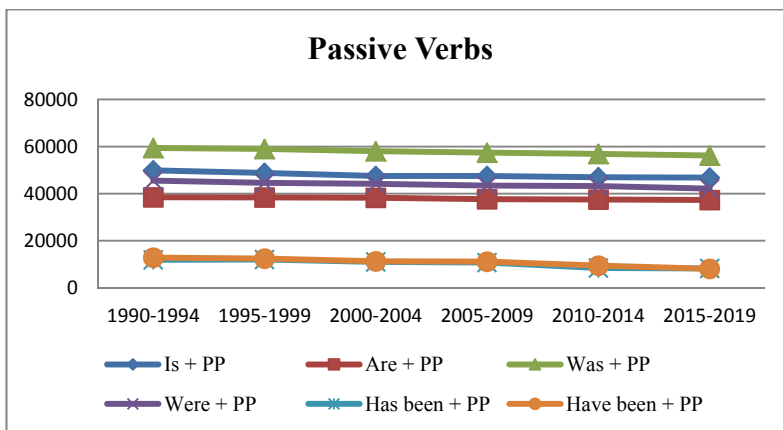
In order to identify the trend of objectivity realization in American academic texts across different time spans, the researchers analyzed the related corpora generated from all the existing cross-disciplinary American academic texts. Accordingly, the obtained results regarding each of the intended linguistic features are presented in separate Tables followed by the related Figures to show the results visually. Table 6 followed by Figure 1 shows the frequencies of occurrence of the most commonly used passive verbs in American academic texts which were generated from various disciplines through 20 years.

Table 6
Frequencies of Passive Verbs Across Different Time Spans

	Is + pp	Are + pp	Was + PP	Were + PP	Has been + PP	Have been + PP	Total
1990-1994	49862	38456	59403	45504	11906	12855	217986
1995-1999	48755	38403	59013	44615	12023	12416	215225
2000-2004	47520	38284	58056	44242	11076	11305	210483
2005-2009	47483	37641	57408	43476	10708	11123	207839
2010-2014	46924	37512	56932	43201	8409	9406	202384
2015-2019	46815	37288	56254	42115	8212	8117	198801

Figure 1

Frequencies of Passive Verbs Occurrence Across Different Time Spans



As is shown, the frequencies of the occurrence of passive verbs in all academic disciplines are lower during 2015-2019 ($n = 198801$) than 1990-1994 ($n = 217986$). Indeed, such a decrease is more observable with regard to two of the included passive structures, namely, “has been + pp” and “have been + pp” during the years 2010 to 2019. In addition, the most frequently used structure of *passive voice* is “was + pp” ($n = 59403$) during the years 1990 to 1994 and the least frequently used structure of *passive voice* is “have been + pp” ($n = 8117$) during the years 2015 to 2019. Table 7 followed by the related Figure 2 indicates the frequencies of the occurrence of personal and impersonal features regarding all cross-disciplinary American academic texts through 20 years.

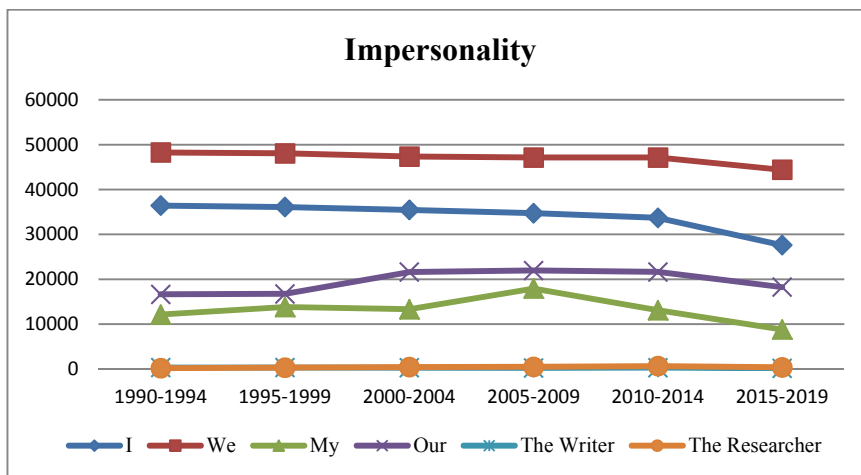
Table 7

Frequencies of Personal and Impersonal Authorial References Across Different Time Spans

	I	We	My	Our	Total of Personal Authorial References	The Writer	The Researcher	Total of Impersonal Authorial References
1990-1994	36403	48225	12143	16627	113398	314	173	487
1995-1999	36084	48056	13809	16732	114681	323	305	628
2000-2004	35440	47336	13316	21606	117698	285	421	706
2005-2009	34723	47132	17944	21954	121753	233	469	702
2010-2014	33684	47131	13107	21622	115544	304	630	934
2015-2019	27607	44405	8812	18264	99088	141	365	506

Figure 2

Frequencies of Personal and Impersonal Authorial References Across Different Periods



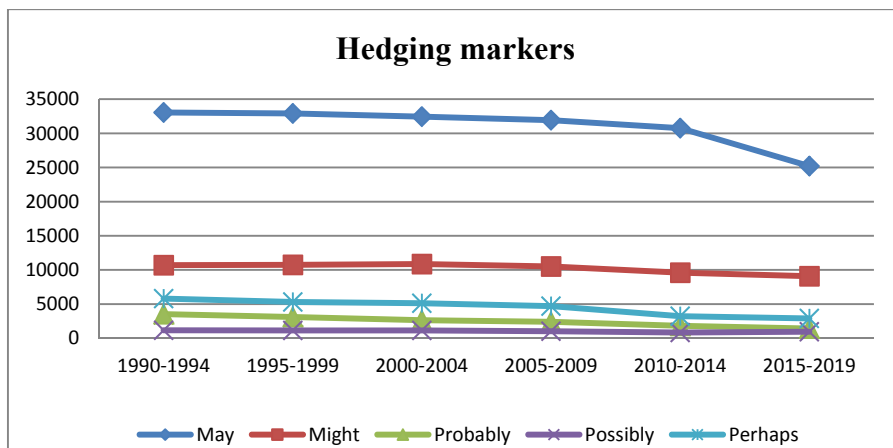
As shown in Table 7 and Figure 2, the total number of occurrences of personal features ($n = 682162$) is more than impersonal features ($n = 3963$) during different time spans. Regarding personal authorial references, it is indicated that the rate of the usage of all personal features decreases from 2010 to 2019. In addition, no considerable differences are shown regarding the usage of impersonal features (i.e., “the writer” and “the researcher”) in American academic texts during different spans. Table 8 and Figure 3 illustrate the frequencies of the occurrence of *hedges* in all cross-disciplinary American academic texts through 20 years.

Table 8

Frequencies of Words Representing Hedging in Academic Texts Across Different Time Spans

	May	Might	Probably	Possibly	Perhaps	Total
1990-1994	33045	10713	3534	1178	5817	54287
1995-1999	32907	10743	3109	1156	5323	53238
2000-2004	32441	10865	2633	1135	5136	52210
2005-2009	31932	10514	2421	1023	4705	50595
2010-2014	30754	9606	1816	832	3231	46239
2015-2019	25207	9089	1417	954	2911	39578

Figure 3
Frequencies of Words Representing Hedging in Academic Texts Across Different Periods

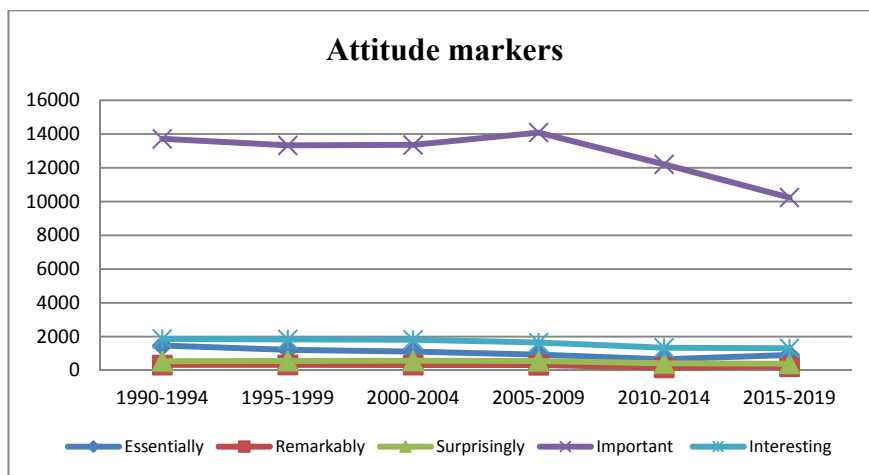


As indicated in Table 8 and Figure 3, the total number of occurrences of *hedging* as one of the linguistic features found in the entire corpus of American academic texts is higher during 1990-1994 ($n = 54287$) than 2015-2019 ($n = 39578$). In addition, no considerable changes are observed regarding the usage of *hedges* in all cross-disciplinary American academic texts across different eras. That is, the rate of the usage of different types of hedges remains approximately the same from 1990 to 2009 and then slightly decreases from 2010 to 2019 except for the modal verb “may”. Table 9 followed by Figure 4 indicates the frequencies of the occurrence of *attitude markers* in all American academic texts of various disciplines through the recent 20 years.

Table 9
Frequencies of Attitude Markers in Academic Texts Across Different Time Spans

	Essentially	Remarkably	Surprisingly	Importantly	Interestingly	Total
1990-1994	1464	316	540	13718	1857	17895
1995-1999	1215	324	549	13325	1832	17245
2000-2004	1109	314	565	13356	1810	17154
2005-2009	932	308	547	14089	1646	17522
2010-2014	656	158	419	12209	1336	14778
2015-2019	908	222	389	10243	1304	13066

Figure 4
 Frequencies of Attitude Markers in Academic Texts Across Different Time Spans



As displayed in Table 9 and Figure 4, the total number of occurrences of *attitude markers* found across American academic texts is higher during 1990-1994 ($n = 17895$) than their occurrences during 2015-2019 ($n = 13066$). Moreover, no substantial variations are found in terms of the frequency of the occurrence of *attitude markers* in all cross-disciplinary American academic texts across different spans. That is, the rate of the occurrence of various types of *attitude markers* remains mostly the same from 1990 to 2009 and then slightly decreases from 2010 to 2019 except for the adverb “essentially” which shows a considerable decrease during 2010 to 2019.

After determining the frequencies of the linguistic indicators of objectivity across different time periods, a chi-square has been used to evaluate the statistical significance of the observed difference in this regard. The differences were found to be significant ($\chi^2(5) = 1122.000$, $n = 5$, $p < .05$), suggesting that across time the occurrence of objectivity manifestations has been meaningfully dissimilar. In other words, different degrees of objectivity are traceable in the discourse of various disciplines during the last 30 years.

Table 10
 Comparing the Frequency of Objectivity Manifestations Across Different Time Periods

	Value	df	Asymp. Sig (two-tailed)
Pearson Chi-Square	1122.000 ^a	5	.004
Likelihood Ratio	786.000	5	.415
Linear-by-Linear Association	56.000	5	.098
N of Valid Cases	5		

Discussion

The findings revealed that *passive structures* were employed differently across different academic disciplines. For example, Breivega et al. (2002), Fløttum (2014) documented the important impact of disciplinary fields on the voice construction of the scientific texts. The considerable occurrence of *passive verbs* in science / technology and medicine, might suggest the importance of what Ding (2002, p. 137) referred to as “falsifiability of science and cooperation among scientists.” Nevertheless, the lowest occurrence of *passive verbs* in philosophy / religion and business might imply the concentration of these fields on the clear-cut transferring of the information to the readers (Ding, 2002) as well as their avoidance of ambiguity, difficulty, and non-representationality, which could be generated by the excessive employment of *passive voice* in academic texts.

A possible explanation for the recent decline in the occurrence of *passive voice* in academic discourse is that recently the writers of academic texts have tried to stick to transparency and directness and move away from ambiguity and obscurity, which could support the findings of earlier studies (Humphrey & Holmes, 2008; Subagio, Prayogo & Iragiliati, 2019) in that they have also shown the decline in the employment of passive verbs in scientific texts. However, the obtained results contradict those of Ding’s (2002) study which referred to the fact that the use of *passive voice* in the 20th century increased in comparison with the 18th and 19th centuries, suggesting the inclination of the scientific authors to represent the world “in terms of objects, things and reason” and not human beings (Alvin, 2014, p. 1). Contrary to the obtained findings of this section, Dumin (2010), who explored the change in the use of passive verbs in research articles of *American Journal of Botany* over 100 years, came to the conclusion that academic researchers moved away from a personal struggle toward a community-based aspect of science through the employment of *passive voice*.

The occurrence of personal / impersonal authorial references across the disciplines indicated that soft sciences (i.e., humanities and social sciences) employed personal authorial references more than hard sciences (i.e., medicine and business), which included further notions of *impersonality* and detachment. This recommends that soft sciences have more inclination to reveal the authorial stance of the writers as compared to hard sciences, whose notable employment of impersonal authorial references suggested that they preferred to stick to elements of neutrality and impartiality. This is exactly in line with Hyland (2004), who believed that in social sciences and humanities, there is no problem to directly refer to personal opinions and judgments.

Regarding the differences between cross-disciplinary usage of *hedges*, the results indicated the higher occurrence of *hedging markers* in soft sciences (i.e., geography / social science, education, and humanities) compared with the hard sciences in line with what Vázquez and Giner (2008) found. Accordingly, the notion of “objectivity” in academic texts of different disciplines is manifested in hard sciences more due to the writers’ less frequently usage of *hedges* in comparison to soft sciences; hard sciences academic writers attempted to be more objective in their

writing to increase the credibility of their proposed ideas and the obtained results. Moreover, it was revealed that all academic writers, depending on the nature of their disciplines, made use of various types of *hedges* not only to weaken their commitment to the proposed ideas in academic texts, but also to show their stance while supporting their claims. These findings are supported by Chang, Luo, and Hsu (2012) who reported the more usage of *hedges* in soft sciences reflecting the authors' subjectivity, in comparison with hard sciences writers who show their objective stance in supporting their argument. While other cross-disciplinary studies also reported the same results (e.g., Elheky, 2018; Sameri & Tavangar, 2013), some studies suggested that the factor of discipline did not have any influence on the use of *hedges* in academic texts (e.g., He & Wang, 2012; Lafuente-Millán, 2008; Sanjaya, 2013). The findings regarding the higher rate of various types of *attitude markers* in soft sciences compared with hard sciences, may refer to the authors' detachment from the proposed claims in the discourse of hard sciences consistent with Hyland (2002; 2004; 2005) and Hyland and Tse (2005).

The identified decline in the employment of personal authorial references from 2010 to 2019, however, might be related to the academic writers' predisposition to stick to "empirical and objective" aspect of academic writing (Hyland, 2005, p. 187) and to "signal credibility, reliability, objectivity, and ultimately authority to their readers and the research community" (Rundbald, 2007, p. 251) in recent years. This is also supported by Elheky (2018) who considered *hedging* as a crucial rhetorical device in academic writing to maintain objectivity and increase the credibility of writing. Such a conclusion is supported by Kim and Lim (2015) who believed that by means of *hedges*, writers modulate their claims providing the readers with an opportunity to take a stance and possibly reject their proposals. The notion of objectivity has been manifested more in academic texts due to the less frequently usage of *attitude markers* in all the analyzed cross-disciplinary texts during the explored time spans. Such a result is supported by Hyland and Tse (2005) who referred to the fewer occurrences of *attitude markers* in the recent academic texts in comparison with the academic texts belonging to the second half of the 20th century.

Conclusion

This inquiry tried to shed light on the realization of the notion of "objectivity" by focusing on specific linguistic indicators to reveal the probable cross-disciplinary differences and the occurred changes in American academic texts, the dominant academic discourse according to Demir (2018) during different time spans through the analysis of COCA. The findings revealed that *passive voice* was manifested differently across different disciplines, and a kind of decline was shown in its use in American academic texts suggesting the inclination of academic writers toward transparency and directness. It was also revealed that personal authorial references were more frequently employed in soft sciences as compared to hard sciences and that fewer number of such indicators could be found in American academic texts during recent years compared with previous decades. In addition, the less employment of *hedging* and *attitude markers* by hard sciences writers led to the greater realization of the notion of objectivity in such sciences in comparison to soft

sciences. Furthermore, the fewer occurrences of *hedges* and *attitude markers* in American academic texts during recent years indicated that writers have recently intended to be more objective in their writing improving the credibility of their works in comparison to the writers' greater use of such features during previous decades developing the subjectivity of their writing.

Finally, it is concluded that the notion of "objectivity" does not have a fixed realization across different academic disciplines, since depending on their nature, this manifestation varies. Furthermore, researchers came to the point that though the writers of American academic texts have shown a kind of predisposition to avoid ambiguity and obscurity by making use of active verbs more than passive verbs, the less employment of *personal authorial references*, *hedging* and *attitude markers* in their works suggests that they have shown the inclination to stick to the elements of impartiality and "objectivity" during recent years adding to the standardization of their works.

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