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Revealing Disciplinary Variation in Pakistani Academic Writing: A Multidimensional Analysis

Musarrat Azher[1], Rabia Faiz[1], Ayesha Izhar[1], Riffat-un-Nisa[2] & Samina Ali[3]

[1] Department of English, University of Sargodha, Pakistan

[2] Department of Education, University of Sargodha, Pakistan

[3] Department of English, University of Lahore, Faisalabad Campus, Pakistan

Correspondance: Musarrat Azher, Department of English, University of Sargodha, Pakistan. E-mail: musarratazher@gmail.com

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Abstract

Pakistani English as a non-native variety exhibits variation at different levels of language. Early quantitative studies on Pakistani English have compared individual linguistic features of Pakistani English with their counterparts in British English and claimed about the distinctive identity of Pakistani English as an indigenous variety. Pakistani English need to be compared at the level of register to further highlight its unique features and strengthen its distinct identity. Based on a special purpose corpus, the present research paper endeavors to investigate linguistic variation across disciplines in Pakistani academic writing as a register. Disciplinary variation is explored along with five new textual dimensions identified and labeled through the technique of Multidimensional analysis (Azher & Mehmood, 2016). The ANOVA results reveal that statistically significant differences are found among disciplines on all the new dimensions of Pakistani Academic Writing. The findings underline the implications for discipline-specific and register-based pedagogies with special reference to Pakistani English.

Keywords: Pakistani English, register studies, Pakistani academic writing, disciplinary variation, multidimensional analysis

1. Introduction

Pakistani English as an indigenous variety reveals variation at different levels of language. Researchers have shown accelerating and expanding interest in its exclusive and unique features over the last many years. Most of the earlier studies have focused on individual linguistic items mainly with reference to lexical, phonological, morphological and syntactic aspects of Pakistani English (e.g., Talaat, 1993, 2002; Baumgardener, 1993, 1993a, 1993b; Mehboob, 2004; Mehmood, 2009; Mehmood, 2009; Rahman, 1991; Kachru & Nelson, 2006). These researches have contributed in the process of codification and the recognition of Pakistani English as a legitimate variety.

The concept of language variation has highlighted the importance of analyzing linguistic patterns across register. Pakistani academic writing is an area that still needs to be explored in terms of linguistic variation. As for the learners, academic writing is very important as their academic career depends on the way they produce academic discourse. This register seeks to be completely defined in terms of linguistic features to develop suitable teaching materials and methods. Therefore, the present research aims to explore linguistic variation across Pakistani academic writing as a register

The most indispensible condition for studying and analyzing any register, according to Biber (1988), is the notion that certain linguistic features tend to co-occur in clusters in any register which characterize the peculiar features of that register. Biber (1988) introduced the idea of co-occurring linguistic features in his book "Variation across Speech and Writing" and proposed multidimensional analysis as a methodology to identify and interpret clusters of co-occurring linguistic features. The sets of co-occurring linguistic features are identified through statistical factor analysis and are interpreted in terms of their shared communicative functions termed as dimensions. After being established the dimensions are assigned a label on the grounds of the shared communicative function executed by the linguistic features.

There are two versions of MD analysis. The first version is associated with Biber's (1988) factor analysis and the established five dimensions which can be used to study any register. The second version is regarded as New MD which refers to the generation of new dimensions on the bases of new factor analysis on the frequently co-occurring linguistic features of any corpora. New dimensions are identified and labeled on the basis of the functional interpretation of sets of co-occurring linguistic features. The present research is based on the exploration of linguistic variation across three academic disciplines along with new textual dimensions as explored on the basis of new factor solution in Azher and Mehmood (2016).

For the present research a special purpose corpus consisting of 235 M. Phil and PhD research theses from different Pakistani universities was constructed to explore linguistic variation across disciplines of Pakistani academic writing. The research theses represent a wide array of subjects broadly categorized in to three major disciplines: Humanities, Social Sciences and Sciences. The application of Multidimensional analysis in the present research will increase our understanding of linguistic variation in Pakistani academic writing across disciplines. Thus the present research seeks to answer the following research question.

How far is Pakistani academic writing linguistically different across disciplines along new textual dimensions?

2. Literature Review

Pakistani English in the early phase of its recognition has been mainly studied with reference to individual lexical, grammatical and phonological features (e.g., Mahboob, 2004; Baumgardner, 1993a, 1998; Rahman, 1990; Talaat, 1993; Baumgarnder,1993b). Recently the focus has been shifted to register variation-based studies (e.g., Shakir, 2013; Ahmed & Mehmood, 2015; Azher & Mehmood, 2016) to further strengthen the independent identity of Pakistani English. All these studies employ multidimensional analysis to explore internal as well external variation in different registers of Pakistani English. They stress the need for further register-based studies on Pakistani English by disregarding the previous studies which relied on the frequency of individual linguistic features. Pakistani academic writing as a register is an area that seeks the attention of the researchers and linguists to further strengthen the distinct identity of Pakistani English. The present study therefore aims to explore disciplinary variation across Pakistani academic writing as a register.

Disciplinary variation is an area that has been much worked upon by the researchers across the globe. Many researchers have found linguistic variation across disciplines and have distinguished lexical and grammatical features of academic writing from discipline to discipline. For example, Parry (1998) investigated disciplinary variation in the writing of PhD students and compared language structures and citation practices across three major disciplines namely: science, social science and humanities. Her findings support the established differences between disciplinary groupings.

There have been studies regarding the diversity of academic writing across disciplines, particularly with reference to how students learn to write for disciplines. Elbow (1991), while working on the writings from different disciplines, also considers that the differences in disciplinary language are clear and obvious, stating that it is common knowledge that academics in different disciplines do not write in the same way. Many researchers have emphasized the need to explore academic writing across disciplines in terms of linguistic variation. McCarthy (1987) describes a student as feeling like 'a stranger in strange lands' as he moves from discipline, and McCarthy believes that the students' success at the university rest considerably on his ability to determine implicit assumptions about what is appropriate writing for each class.

As many studies show that language use differs from discipline to discipline, however there are some studies which have highlighted certain characteristics shared by academic disciplines (John, 1995; MacDonald, 1994). Therefore, there always remains a need to make new arguments and create new knowledge (Conrad, 1996) and situate them within previous work in the relevant discipline. Linguists and researchers have agreed that disparity in the use of language are according to the disciplinary variations and perspective and that both students and professionals would benefit from knowing more about linguistic features of different disciplines.

Not many corpus bases studies have tried to explore the linguistic features of academic writing across disciplines. Biber (1988) in his study Variation across speech and Writing compares 23 spoken and written registers including academic prose as well. The texts taken as academic prose represents three major disciplines in broader sense: sciences, social sciences and humanities. The results show that all sub genres contain features which make them highly informational with an exception to mathematics in sciences that uses more mathematical expressions. Humanities prose is more narrative as compared to technology and engineering prose that focuses more on abstract 'factual, faceless and agentless' (Biber, 1988, p. 194) concepts and findings.

Another corpus-based study on disciplinary variation comes from Susan M Conrad (1996). She investigated

language variation in academic discourse across two diverse disciplines: biology and history (represented by ecology and American history). She developed a corpus both of the professional texts which students use to study during their academic career as well as students' writing (including original research papers and synthesis papers). The key areas of her study are: variation across disciplines, variation across levels of text books, similarities between academic and non-academic registers of English, and differences between research articles and textbooks within each discipline. Some important patterns were revealed in disciplinary writing in the use of features of narration, over-argumentation, and impersonal style. The results show that there exists a complex relationship among the text categories.

Katherine (2011) investigated the linguistic patterns of undergraduate students' writings in the subjects of chemistry and psychology. The multidimensional analysis of the corpus and interviews with the faculty and students revealed a mismatch between the expectations of instructors in each discipline and students' understanding of such writing expectations. The linguistic analysis of course readings and student writing demonstrated differences in language use both between registers and across disciplines.

Gray (2011) in her PhD thesis on academic writing analysed linguistic variation across 270 research articles through multidimensional analysis. The articles were taken from six diverse disciplines: philosophy, history, political science, applied linguistics, physics and biology. The articles are also grouped as theoretical, quantitative and qualitative research reports. This corpus-based study reveals that variation occurs along multiple parameters along with differences in disciplinary writings.

Hardy and Ute Romer (2013) studied the sets of co-occurring lexico-grammatical features of upper level student papers. The study was based on the corpus (MICUSP, 2009) comprised of students' papers from sixteen different disciplines. The researchers used multidimensional analysis to identify dimensions of frequently co-occurring features that best account for cross-disciplinary variation in MICUSP.

Jesse Egbert (2015) describes the linguistic variation across three publication types (journal articles, university textbooks, and popular academic books) in two disciplines (biology and history). The study is both quantitative and qualitative in nature based upon Multidmensional analysis, series of ANOVA and Post Hoc test as well as qualitative interpretations.

Gardner et al. (2008) investigated linguistic variation in British higher education students' writing across disciplines and levels along with Biber 88 MD analysis particularly with reference to genre families. The corpus of British Academic Written English (BAWE) contained 2,761 students' assignments from 35 disciplines and four levels of study. The grouped disciplines include: Arts and Humanities, Social sciences, Life Sciences, and Physical sciences. The results show that the overwhelming majority of Arts and Humanities texts and slightly more than half the Social Sciences texts belong in the essay "genre family", while texts from the Life Sciences and particularly the Physical Sciences are more evenly spread across a wider range of genres.

Recent diachronic studies have shown that science writing has adopted this dense nominal style to a much greater extent than social science or humanities writing over the past 100 years (Biber & Gray, 2013). This finding supports the premise that disciplinary variation in the use of core grammatical features exists, although this line of research has generally not been concerned with disciplinary variation.

All these studies indicate that interpretations are related to the differing nature of disciplines while considering academic writing extending to text book, articles, students' writings etc. The studies in disciplinary variation have become increasingly relevant as more and more specificity are required in disciplinary writings. Students have to write in manners that conform to the nature and formalities of discipline. Research dissertations characterize the knowledge of the disciplinary community. That knowledge is constructed through varied use of linguistic features. How do these features contribute in disciplinary writing in Pakistani context is important to study.

The disciplinary variation explored in the present research is based on the new dimensions (Azher & Mehmood, 2016) identified on the basis of new factor solution on each dimension. These dimensions are briefly discussed as under.

Dimension 1 named as "Interactive Expression vs. Informational Academic Discourse" is the most dominating dimension comprising of 27 positive and 6 negative linguistic features. The positive side of the pole indicates interactive and involved expression, whereas, negative side of the pole represents informational discourse. Stance verbs carry the highest weight on this dimension and co-occur with private verbs along with other verbs of desire and communication. Different categories of verbs along with discourse particles, first person pronoun, on positive pole characterize Pakistani academic writing as interactive and communicative.

The high frequency of nouns along with adjectives and prepositions indicates that information is dense in

Pakistani academic writing. Prepositions are generally used as a gadget to incorporate high amount of information in academic writing. Thus both positive and negative features lead to the interpretation of dimension 1 of Pakistani academic writing as (+) Interactive Expression Vs. (-) Informational Academic Discourse.

Dimension 2 of Pakistani academic writing is labeled as "Contextualized Description vs. Detached Reference". This dimension is marked by 17 positive and 3 negative linguistic features on factor loading. On the positive pole, coordinating and subordinating conjunctions co-occur with factive adverbs, adverbials, emphatics and nominal and demonstrative pronouns, indicating situational and circumstantial stance of Pakistani academic discourse.

Features with negative loading include nn_all, proper noun, passive_post-nom and common nouns as indicators of detached style in Pakistani academic written discourse. On account of its co-occurring features, dimension 2 of Pakistani academic writing is labeled as Contextualized Description vs. Detached Reference.

Dimension 3 is marked by the dense presence of present progressive verbs with place adverbials, third person pronouns and preposition final, indicating ongoing continuous state of actions taking at specific places.

The presence of progressive verbs, prepositions at final places, adverbial hedges and contractions marks a Pakistani academic written discourse as informal and casual. Hedges are informal, less specific markers of probability or uncertainty. The negative pole is characterized by all features which make academic writing more formal and extended. Nominalization with passives is a useful technique to present great deal of information in more concise and formal way. Amplifiers are further used to add beautification in the academic discourse and mark formal and extended discourse to elaborate information.

Dimension 4 is characterized by the frequency of past verbs, with perfect verbs and coordinating conjunction phrases on positive side of the polarity. On negative side nn_premod, present verbs, pro_2, have verb, all indefinite articles, co-occur on this dimension. The features on this pole show non-narrative concerns of Pakistani academic writing.

Dimension 5 is predominated by adjectives and attitudinal verbs on positive pole. The frequent co-occurrence of attitudinal adjectives and verbs reveals subjective opinion and evaluation-based stance of the writer. The negative side of the polarity on this dimension is marked by technical nouns, all definite articles, group nouns showing an impersonal attitude towards the informational discourse. These features with negative scoring characterize Pakistani academic writing with technical descriptive style.

3. Materials and Methods

3.1 Data Collection and Compilation of Corpus

The present research is corpus based in design. The corpus was developed on the basis of M. phil and PhD research dissertations collected from three major disciplines representing a wide array of academic subjects. The theses were collected on the basis of convenient sampling from different universities and HEC research repository. The corpus consisted of 235 research theses in total and represented multiple subjects within three selected disciplines or 'disciplinary groups' in the words of Gardner (2007). Humanities and Social Sciences were represented by 80 theses each, whereas Sciences were represented by 75 theses due to unavailability of theses in the selected subjects and as per convenient sampling. Finally, a corpus of 8.385000 million words was developed after certain editing in the original drafts of theses.

3.2 Analysis of Data

The process of data analysis in the present research has been done in four major stages. In the first stage, the corpus was tagged with Biber' Tagger for 189 linguistic features, which included many other linguistic features along with those 67 introduced by Biber in his 1988 study.

In the second stage, the frequencies of the linguistic features were counted through Biber's Tag Count program and were normalized by computing out of 1000 words. Normalization was done to cope with the varying length of the texts. "A comparison of non-normalized counts will give an inaccurate assessment of the frequency distribution in texts" (Biber, 1988, p. 75).

In the third stage, the dimension score of each text of Pakistani academic writing was calculated. This calculation was done by subtracting the standardized scores of negative features from the sum of standardized scores of positive features.

In the fourth and last stage, two factor ANOVA in SPSS was administered to see the statistically significant differences among disciplines.

4. Results

The following table presents the ANOVA results to indicate statistically significant differences among disciplines on five new textual dimensions of Pakistani academic writing.

Table 1. Dimension x discipline interaction Mean±SE

	Humanities	Sciences	Social Sciences
D1	-6.5±0.9B	-9.8±1.1B	-7.2±1.0B
D2	-11.4±2.0A	-21.7±2.4A	-16.5±2.0A
D3	-5.5±0.4B	-5.0±0.4C	9.8±0.5C
D4	-7.5±0.8B	-7.1±0.9BC	-7.4±0.8B
D5	4.2±1.2C	5.7±1.1D	6.5±1.2D
Mean	-6.2809	-9.1291	-3.3009

Note. Means sharing similar letter in a row or in a column are statistically non-significant (P>0.05).

Table 1 reveals that there lie statistically significant differences among disciplines on D3, D4 and D5, whereas there lie no statistically significant differences among disciplines on D1 and D2.

5. Discussion

5.1 Variation Across Disciplines on D1

The ANOVA results indicate that there lie no statistically significant differences among Humanities, Social Sciences and Sciences D1 of Pakistani academic writing. All the disciplines on D1 have negative mean dimension scores and are shown as highly informational rather than interactive in the production of academic discourse. The table below draws a comparison among disciplines of Pakistani academic writing.

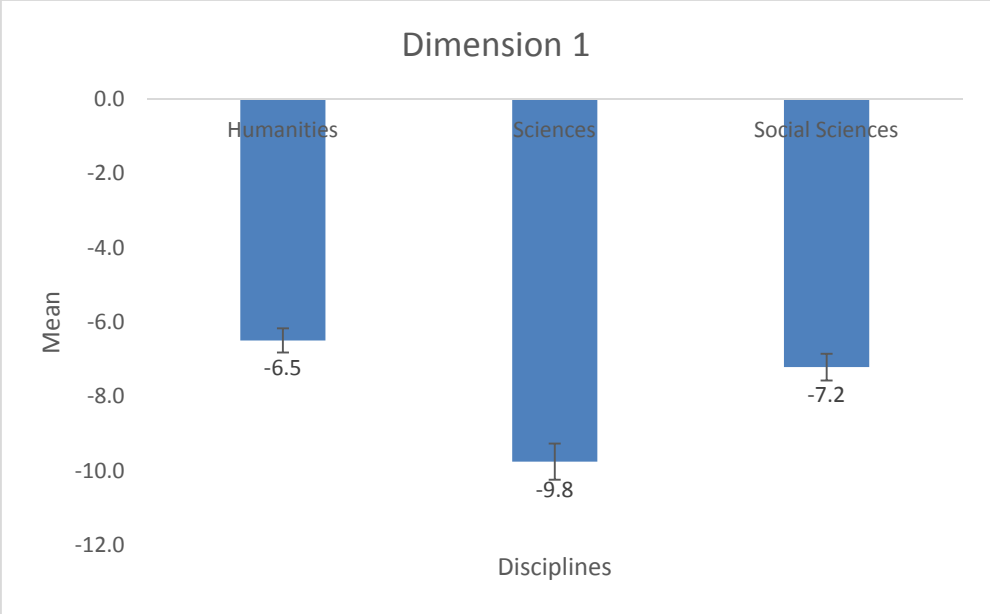

Figure 1a. Comparison among disciplines on D1

Figure 1a illustrates the comparison among three disciplines and reveals that Sciences are at the distinct position in being the most informational discipline with the highest mean score of -9.8 among all. Humanities with mean score -6.5 have been found least informational among all disciplines. This clearly speaks of the inclination of humanities towards interactive discourse as compared with other two disciplines. Social Sciences with mean score of -7.2 stand at the middle position and have been found more informational than Humanities, but less than Sciences in the presentation of informational discourse. In other words, Sciences have been found least interactive among all disciplines.

The differences among disciplines are further investigated in terms of the linguistic features of informational discourse. The linguistic features which characterize informational discourse include nouns, prepositions and attributive adjectives. The figure 1b given below illustrates the distribution of linguistic features with informational focus across three disciplines and shows a very high mean score ranging from -62.54125 to -260.28.

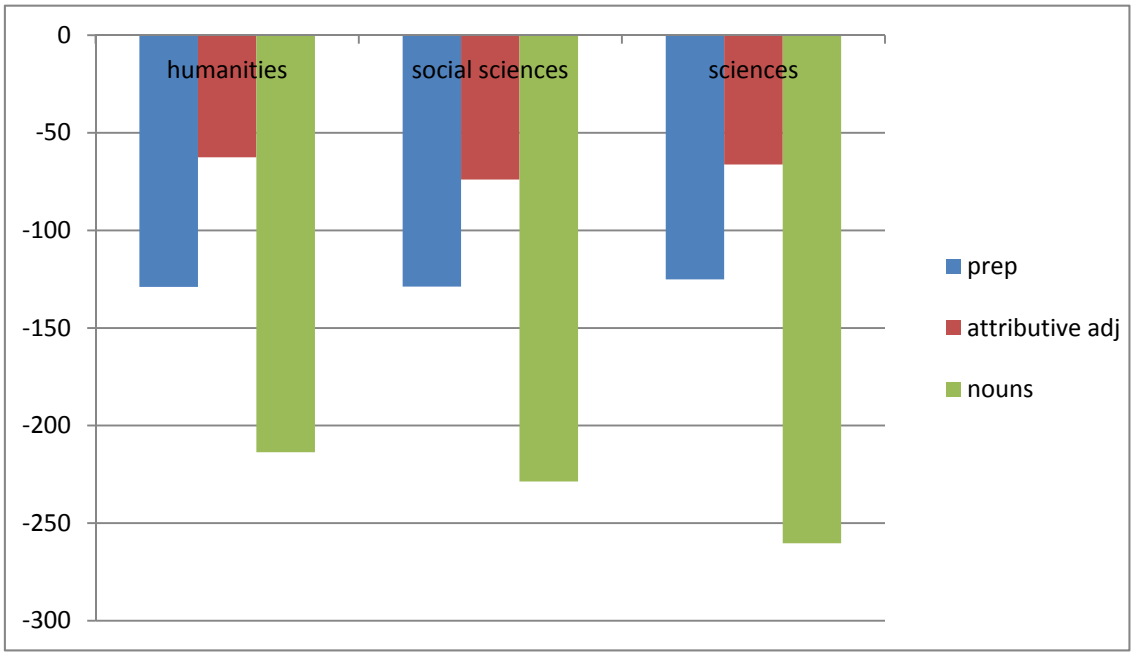

Figure 1b. Features of informational discourse across disciplines on D1

Figure 1b exhibits the comparison among disciplines on the density of informational linguistic features and reveals what makes Sciences the most informational is the highest frequency of nouns with mean score -260.28. Nouns with mean score -213.6675 are least frequent in Humanities which show the different concerns of two disciplines on the description of entities, referents and objects. Attributive adjectives are the most frequent linguistic feature in Social Sciences having the highest mean score of -73.93875 and add into the informational stance of Social Sciences. Prepositions with mean score -228.9913 are occurring slightly more frequently in Humanities than Social Sciences and specify the referents of the nouns more clearly. Overall, it is shown that Sciences rely on nouns to a great extent for producing informational discourse. This finding is in accordance with the recent findings by Biber and Gray (2013) that 'the dense nominal style of academic writing has been adopted to a much greater extent in science writing than in non-science writing over the past 100 years' (p. 165).

The following excerpt from Sciences exhibits the density of nouns, prepositions and attributive adjectives.

Example (1)

> **In Pakistan newly developed packages of post harvest system** reduce the **post harvest losses**. But there is **arrange of variation in the losses among the forms in different regions**. **Estimation of losses after harvest in various regions** and **within a region** is desirable **for** understanding **of the extent of the post harvest losses and losses of the different operation systems**. (Text 234, 2, S)

The above given passage reveals the extremely informational stance of Pakistani academic writing highly packed into nouns, prepositions and attributive adjectives.

D1 of Pakistani academic writing has some similarities with the results of Gray's dimension 1 (2013) in comparison of Sciences and non-sciences, where Sciences are found most informational as they rely on the features of informational stance to greater extent than Humanities and Social Sciences.

Two situational characteristics seem especially important as regard the variation among these disciplines: nature of subject matter and background knowledge of the readers. Humanities include subject matters like languages, mass communications and history and focus on general topic areas related to human behavior and nature and are less informational. Social Sciences deal with subjects like education, psychology and sociology and focus on social

issues in scientific ways, thus tend to be more informational than humanities. Sciences deal with subjects like biology, physics, pharmacy, information technology and focus on objects and materials. Being highly equipped with nouns, sciences become highly informational. As for the background knowledge, readers of sciences are expected to have more specific knowledge than the readers of Social Sciences and Humanities, thus the writings produced are likewise.

Therefore, it seems justified to have such variations among disciplines that sciences would be more informationally dense as compared to the other two disciplines. Humanities are less informationally dense as they deal with human behaviour and less knowledgeable readers in comparison with those of Sciences and Social Sciences.

5.2 Variation Across Disciplines on D2

The ANOVA results indicate that there lie no statistically significant differences among Humanities, Social Sciences and Sciences D2 of Pakistani academic writing. All the disciplines on D2 have negative mean dimension scores and are shown as highly detached rather than contextualized. The figure given below draws a comparison among disciplines of Pakistani academic writing on D2.

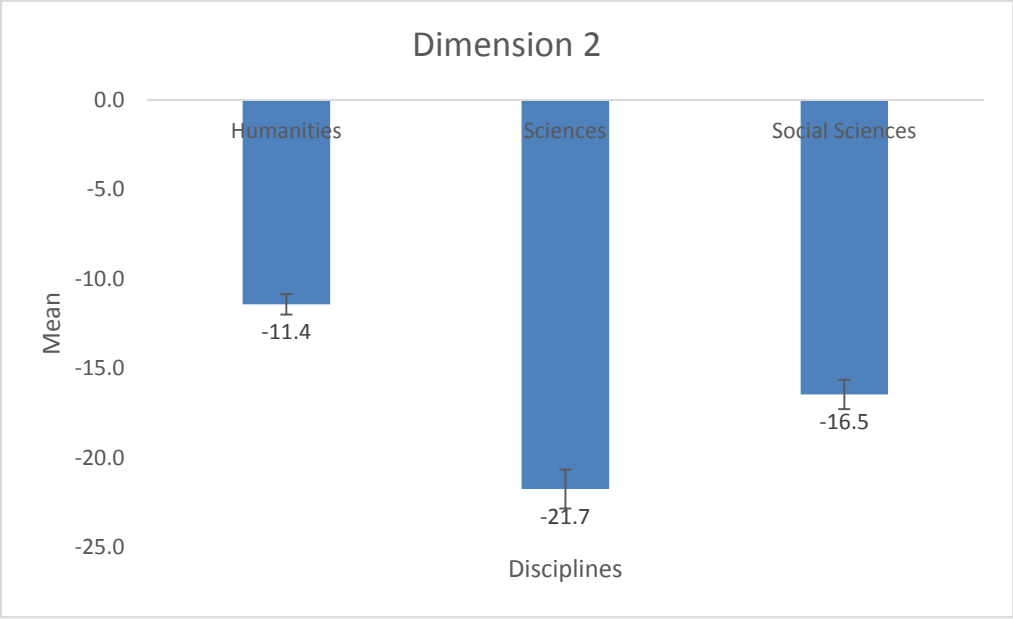

Figure 2a. Comparison among disciplines on D2

Figure 2a illustrates the comparison among disciplines of Pakistani academic writing on D2 and reveals that all the disciplines are highly detached and objective in style. Sciences among all disciplines have been found the most detached with the highest mean dimension score of -21.7; whereas, Humanities have been revealed the least detached in style with the minimum mean dimension score of -11.4. Social Sciences as on D1 stand at the middle position with the mean score of -16.5 and have been found less detached than Sciences but more than Humanities. The results show that Humanities are comparatively more inclined towards context depending discourse, whereas, Sciences have been found the least context dependent discipline.

The differences among disciplines can further be explored in terms of the occurrence of the negative features (nn_all, nn_proper and passive post-nominal) on this dimension. The Figure 2b given below illustrates the distribution of linguistic features with detached reference across three disciplines.

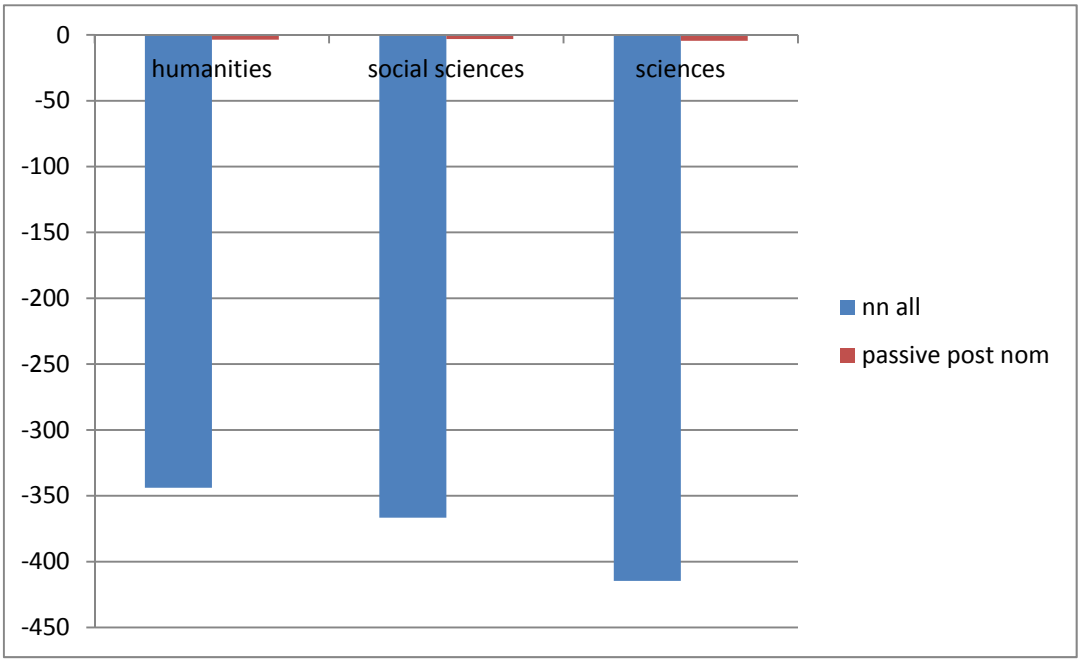

Figure 2b. Features of detached reference across disciplines on D2

Figure 2b exhibits the comparison of linguistic features of detached reference on D2 and reveals an extremely high frequency of nouns and passives in Sciences (-414.6147). Nouns refer to entities, concepts and materials; whereas, passives are used to minimize the importance of agents and to present information in an impersonal style. The highest scores of nouns along with passives demonstrate the highly detached and impersonal style of Sciences as compared to other two disciplines. Nouns with the mean score of -343.9225 are at minimum ratio in Humanities; however, passives with the mean score of -3.125 are at their minimum in Social Sciences. This distribution of features shows that Sciences present information in highly detached manners, whereas, Social sciences and Humanities are concerned with the less detached and more contextualized presentation of information.

The below given example from the discipline of sciences demonstrates the highly detached style of Pakistani academic writing. The linguistic features of detached discourse (nouns and passive structures) are highlighted in bold.

Example (2)

> Composite **samples** of domestic **sewage were collected** from **the Garden Town municipal wastewater pumping station of Metropolitan Lahore.** Sampling **periodwas spanned** over six **months** (from January 2005 to June 2005). **Sampling was carried out** at an interval of 3 **hrs** and three **days** a **week** during **the operation** of pumping **station**. (Text 222, 3, S)

The example above gives a plenty of information by using nouns in a very detached style. All the three sentences are found to be using passive verbs where agents are missing.

As the differences among the three disciplines in the use of detached style are concerned, the nature of subjects is important here. Humanities are more concerned about human behavior and human events, therefore, the texts tend to be using contextualized discourse with humans as subjects or agents. Sciences are more concerned with materials and objects, and least with human events, therefore, the texts tend to be least personal and subjective and become extremely detached in the process of giving information. Social Sciences focus on social issues in scientific ways, thus deal with them in comparatively more detached style than Humanities.

The D2 of the present study has been found having similar features as well as results with Dimension 3 of Hardy and Romer (2013), labeled as 'situation-dependent, non-procedural evaluation *versus* procedural discourse'. Both dimensions share some similar features like nouns and passives occurring on negative and adverbials on positive pole.

Overall, Pakistani academic writing has shown a trend towards detached style of writing, with sciences as the most impersonal in style and humanities as the least detached in the presentation of informational discourse.

5.3 Variation Among Disciplines on D3

The ANOVA results indicate that there lie statistically significant differences among Humanities, Social Sciences and Sciences D3 of Pakistani academic writing. The results on D3 reveal that Humanities and Sciences have negative mean dimension scores and are shown as highly formal rather than informal; whereas, Social Sciences are found to have positive mean score and are revealed to be informal in the production of academic discourse. The figure given below draws a comparison among disciplines of Pakistani academic writing on D3.

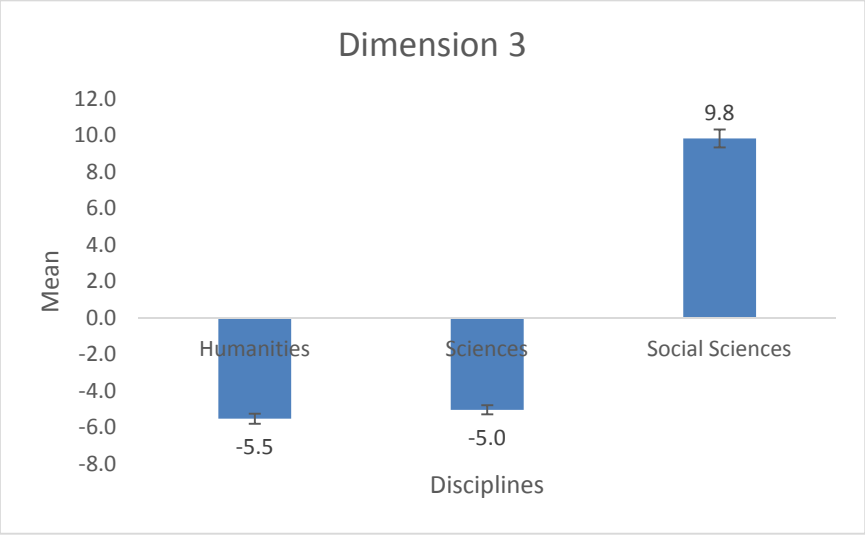

Figure 3a. Comparison among disciplines on D3

Figure 3a exhibits the comparison among Humanities, Sciences and Social Sciences on D3 and reveals that Sciences and Humanities are formal in style, whereas, Social Sciences are found to be informal in manners. However, interestingly Humanities with the mean score of -5.5 have been found the most formal discipline on this dimension. Sciences have been shown less formal having the minimum mean score of -5.0 on this dimension. On the other hand, Social Sciences are found to be highly informal with much greater positive mean score of 9.8.

The variation among disciplines can further be investigated in terms of the linguistic features of formal discourse. The major linguistic features which exemplify formal discourse include process nouns, passives, nominalization and amplifiers. The Figure 3b exhibits the distribution of linguistic features of formal discourse across three disciplines of Pakistani academic writing.

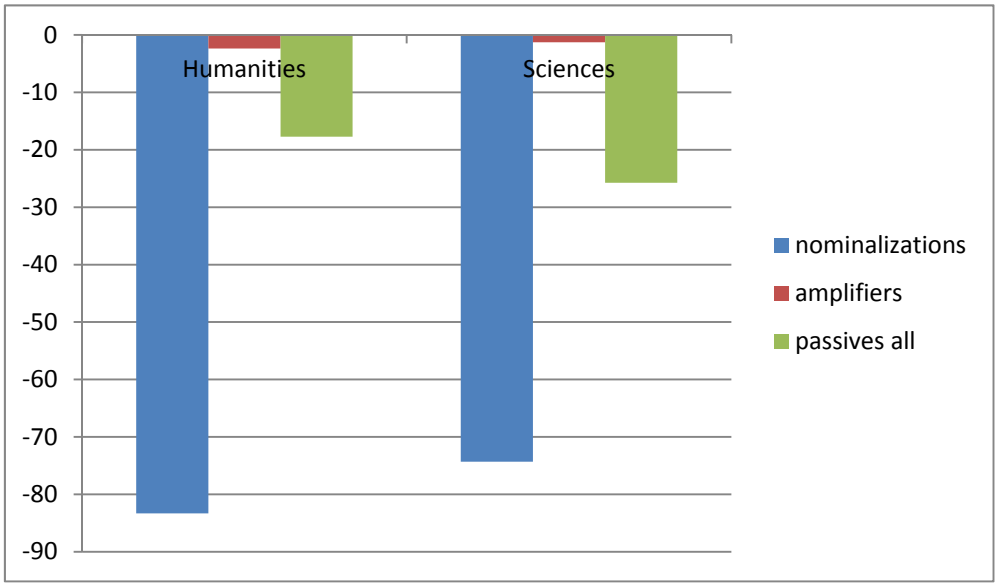

Figure 3b. Features of formal discourse across disciplines on D3

Figure 3b exhibits the features of formal discourse across Humanities and Sciences and reveals what makes Humanities as the most formal discipline among all is the extensive use of nominalizations (-83.3175) and amplifiers (-2.37). However, as on the hand, Sciences are exceeding in the use of all passives with the mean score of -25.732.

Humanities are concerned with general issues of human life; whereas, Sciences focus on the procedures and evidences about specific entities. 'Tying the specific study to general issues seems to correspond with use of more nominalizations, while the reporting of procedures and evidence corresponds with fewer nominalizations' (Conrad, 1996, p. 188). The following example exhibits the formal style of discourse of Humanities.

Example (3)

> 'Other dreams of the series show the **continuation** of this **individuation process**. The **interpretation** of the first dream show that the archetypal symbols do occur and help to change the **status** of the dream from a meaningless **fragmentation** to a meaningful entity. **So** here we find the answer to our first research **question** i.e., the dreams presented by Naguib Mahfouz are not meaningless and we can give them meaning by understanding the **archetypes** they carry. This **will be proved** by the **interpretation** of other dreams as well'. (text 28, 4, H)

The excerpt given above is taken from the discipline of humanities that is clearly associated with human behaviour.

5.4 Variation Among Disciplines on D4

The ANOVA results indicate that there lie statistically significant differences among Humanities, Social Sciences and Sciences on D4 of Pakistani academic writing and that sciences are significantly different from humanities and social sciences. All the disciplines on D4 have negative mean dimension scores which show that they are highly non-narrative rather than narrative in style. The Figure 4a given below draws a comparison among the disciplines of Pakistani academic writing.

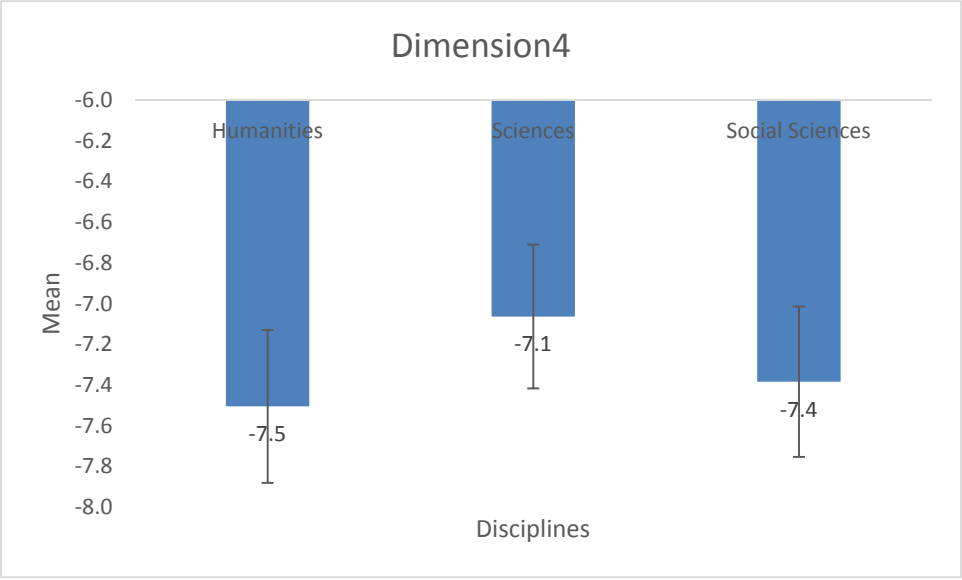

Figure 4a. Comparison among disciplines on D4

Figure 4a draws a comparison among the disciplines of Pakistani academic writing on D4 and reveals that all the disciplines are highly expository and non-narrative. On D4 Pakistani academic writing has shown bit surprising results. Humanities which have been shown comparatively interactive, contextualized, and less formal are found to be characterized by the most expository discourse, whereas, Sciences are found amazingly inclined towards narrative discourse. On D4 Humanities have the highest mean dimension score of -7.5, Social Sciences are second to Humanities by having slightly less mean score of -7.4, while Sciences are found to have the minimum mean score of -7.1.

The variation among three disciplines can be further explored by the distribution of present verbs across three

disciplines. Figure 4b illustrates the variation among three disciplines in the use of present verbs.

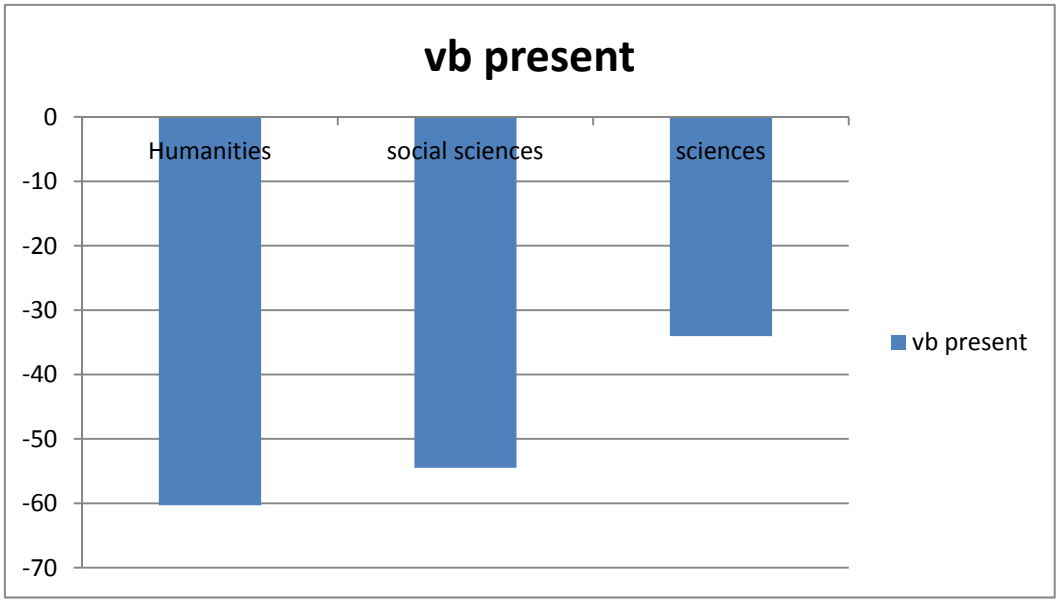

Figure 4b. Features of non-narrative discourse across disciplines on D4

Figure 4b presents a comparison among disciplines on the frequency of present verbs and exhibits the non-narrative style of Pakistani academic writing. Surprisingly, present verbs with the mean score of -60.29375 are most frequently occurring in Humanities, thus showing their maximum non-narrative trend on this dimension. Sciences are found to have the minimum mean score (-34.04133) in the use of Present verbs which show the inclination of Sciences towards narrative style. Social Sciences with the mean score of -54.475 remain at medial position. The example given below from the discipline of Humanities exhibits the high frequency rate of present verbs.

Example (4)

> The students in our schools usually **write** for the teacher or an examiner. But not much thinking **goes** into their writing, which **isn't** really their fault all that much because that **is** the way they **have been** taught. They **copy** from a textbook or the blackboard into their copy and **submit** it to the teacher. This practice of copying **limits** them to the ideas of the others and they never **try** to write formulate and **write down** their own original ideas. Besides, teacher mostly **require** a one sentence answer. (Text 25, 1, H)

The example reveals the text as highly loaded with present verbs which marks the non-narrative style of humanities. The results on this dimension have shown quite a deviant trend, different from the expectations made from previous researches. As, these results are quite different from previous studies on disciplinary variation in academic writing. For example, Egbert (2015) on publication type and discipline variation in published academic writing and found biology as more non-narrative than history. The findings are also different from Hardy and Romer (2013), where Social Sciences and Humanities are found to be more narrative than sciences.

5.5 Variation Across Disciplines on D5

The ANOVA results illustrate the variation among three disciplines of Pakistani academic writing and indicate that on D5 there lie statistically significant differences among Humanities, Social Sciences and Sciences and that Humanities are significantly different from Sciences as well as Social Sciences. All the disciplines on D5 have positive mean dimension scores which show that they are highly characterized by evaluative stance rather than technical description. The Figure 5a given below draws a comparison among the disciplines of Pakistani academic writing.

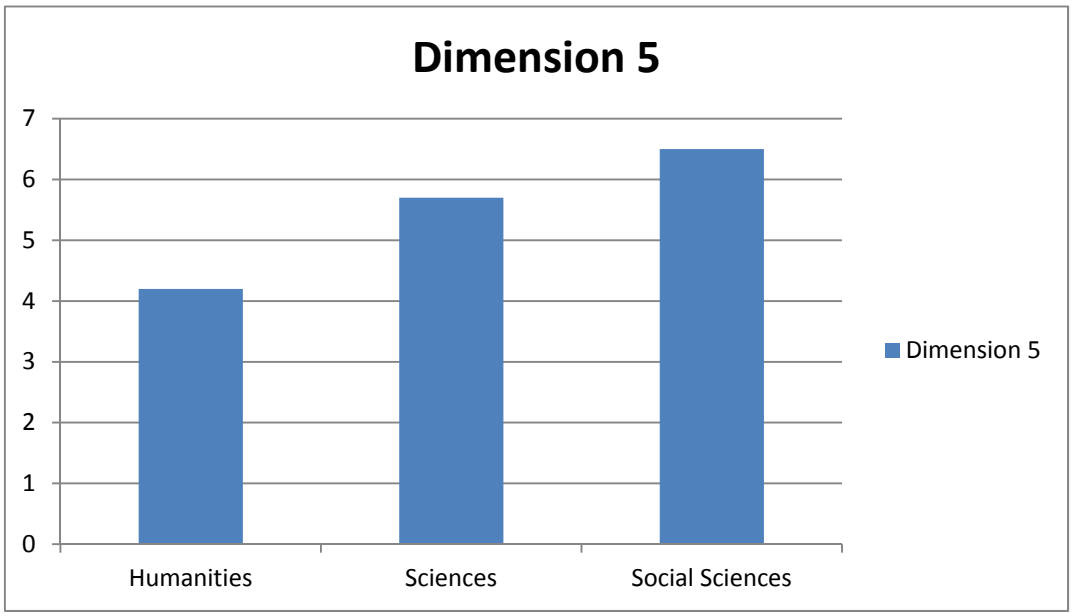

Figure 5a. Comparison among disciplines on D5

Figure 5a illustrates the comparison among humanities, social sciences and sciences and reveals that Social Sciences with the highest mean score (6.5) are the most evaluative in the production of academic discourse as compared to the other two disciplines. Humanities have significantly the lowest mean score (4.2) and are found to be the least evaluative, whereas, Sciences with the mean score of 5.7 present less evaluative academic discourse than Social Sciences but more than Humanities. The results reveal that Humanities are most inclined towards topic based technical description as compared to the other two disciplines. Social Sciences on the other hand are showing minimum trend of technical description.

The comparison among disciplines can further be investigated in terms of linguistic features characterizing evaluative discourse. The linguistic features of personal/evaluative stance on this dimension include attitudinal adjectives, all adjectives, attitudinal verbs, stance nouns and suasive verbs. Figure 5b given below illustrates the comparison among three disciplines in terms of the linguistic features which stand for attitudinal and evaluative stance of Pakistani academic writing.

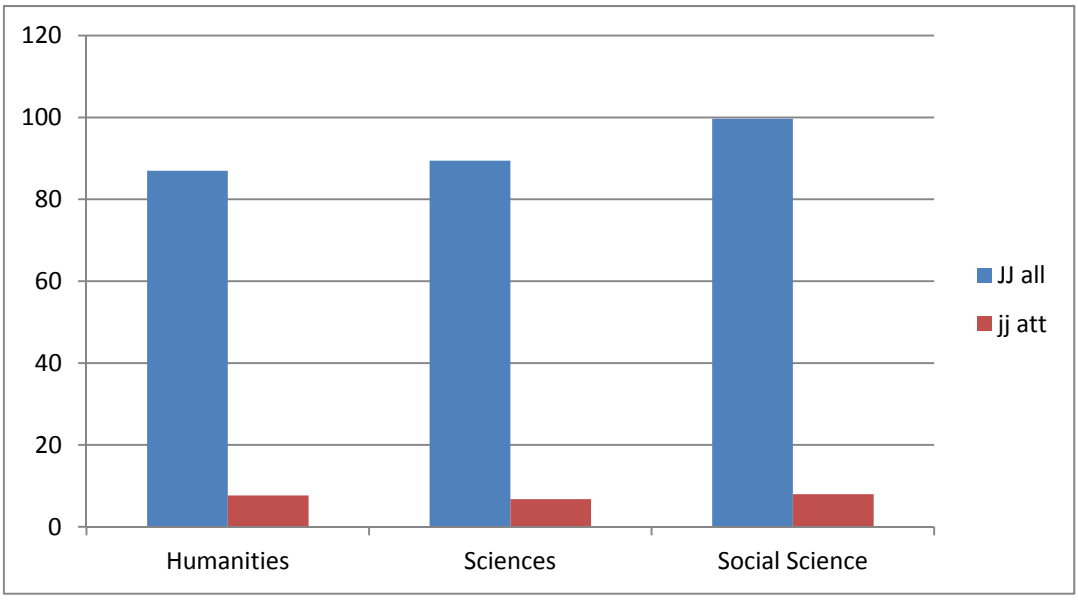

Figure 5b. Features of evaluative stance across disciplines on D5

The density of all types of adjectives and attitudinal adjectives is shown in the Figure 5b to represent the evaluative stance of Pakistani academic. Both the linguistic features are found to be common among all the three disciplines, however, adjectives (86.98375) are found to be less dense in humanities as compared to the other two disciplines. Both adjectives (99.685) and attitudinal adjectives (7.985) with the highest frequency rate are found to be the most common in Social Sciences. Adjectives along with those of attitudinal stance add personal stance into the informative discourse of Pakistani academic writing. The following example from the discipline of Social Sciences exhibits the evaluative stance of Pakistani academic writing.

Example (5)

> **"Happiness, sadness, anger, boredom, Fatigue, threat, fear, stress a**nd all other **emotional** states of body change the brain physiology and pattern formation is also **affected**. **Moods and feelings** of the students play an **important** role in pattern formation." (Text 150, 1, SS)

With respect to the differences among disciplines in the use of evaluative style, the results are bit surprising and deviant from the previous researches. As the situational characteristics of the three disciplines with reference to the nature of subjects are concerned, Humanities being associated with human behavior and events are surprisingly least evaluative and provide minimum attitudinal stance in the presentation of information. The relationship between Sciences and Social Sciences seem justified. Social Sciences deal with social issues, involving matters related to everyday life, so are the most evaluative and provide maximum attitudinal stance in the presentation of informational discourse of academic writing.

The findings on this dimension show that Pakistani academic writing is not only based on informational discourse, but provides judgmental information, colouring it with the attitudinal stance.

6. Conclusion

From the above discussion on disciplinary variation across Pakistani academic writing, it seems clear that almost all disciplines are unified in focus on all dimensions. At the same time, interesting differences are found on each dimension when these disciplines are considered relative to one another.

On D1 of Pakistani academic writing all the three disciplines are found to be highly informational. However, Sciences with the highest frequency of nouns -260.28 are more oriented towards the description of entities and become exceedingly informational. Social Sciences rely on attributive adjectives more than nouns for being second highest informational discipline and provide elaborated informational discourse. Humanities are found as the least informational discipline among all; however, being equipped with the highest frequency of prepositions, they provide information more clearly.

The informational stance of Pakistani academic writing is found close to the findings of Gray (2011), Hardy and Romer (2013) and Egbert (2015). However, the reasons on the informational stance may vary. The variation in disciplines of Pakistani academic writing relies on the nature of subject matters on which these disciplines are based and the different background knowledge of the readers of these disciplines.

On D2 Pakistani academic writing with due variation among disciplines has been found highly detached and objective rather than contextualized. Sciences are found to be extremely detached with the highest frequency of nouns and passive post-nominals. Social sciences, with the minimum ratio of passives, and humanities, with minimum ration of nouns, are found less detached and objective in the presentation of the informational discourse. D2 of Pakistani academic writing has certain similarities with the D3 of Hardy and Romer (2013), however, relies on the different situational characteristics in being detached and objective.

D3 reveals interesting results. Humanities with exceedingly high frequency of nominalizations and amplifiers have been found the most formal discipline among all. Sciences have been found less formal with less frequent use of the features of formal discourse. Opposite to these disciplines, Social Sciences have been found highly informal in style.

On D4, Pakistani academic disciplines have shown again surprising and deviant results from previous researches (e.g., Egbert, 2015; Hardy & Romer, 2013). Humanities though associated with history, literature and mass communication have been revealed the most non-narrative discipline relying more on present verbs than the other two disciplines. Interestingly, on this dimension, Sciences, though more concerned with factual and figurative information have been found least non-narrative in the production of academic discourse.

D5 represents the attitudinal and evaluative stance of Pakistani academic writing with due differences among three disciplines. Social Sciences with the highest frequency of adjectives and attitudinal verbs have been found the

most evaluative instance, whereas, humanities are found the least evaluative and inclined towards technical description as compared with other two disciplines.

As far the linguistic features, Pakistani academic writing is marked by the density of nouns, nominalizations, present verbs, adjectives and passives.

Overall, Pakistani academic writing when viewed in terms of disciplinary variations, has been found highly informational, highly detached, highly formal, non-narrative and evaluative in discourse. These variations across academic disciplines have been connected with the nature of subjects and different readership associated with these disciplines.

Pakistani academic writing has also shown some deviant trends across disciplines, which exhibit the distinct characteristics of Pakistani academic writing and can be viewed as norms. The present research is significant as it would benefit those working on register variation in Pakistani English to draw comparisons and explore linguistic features pecuilier to other registers. The findings of the current research may be considered as norms of Pakistani academic writing and be compared with those of the prospective researches on articles and text books in the context of Pakistani academic writing and further comparisons may be drawn across multiple registers.

The present research on academic writing as a register convinces that other regsiters as language of Law, language of Business, Language of Religion etc. in the context of Pakistani English should also be explored on the basis of MD based studies. The comparative study of different registers will definitely evaluate the distinctiveness of Pakistani English as a non-native variety in a comprehensive manner.

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