Linguistic Variation across Research Sections of Pakistan Academic Writing: A Multidimensional Analysis

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Abstract

With the concept of language variation, it has become utmost important to analyze linguistic patterns across register. Pakistani academic writing like other registers in Pakistan is an area that still seeks the attention of the researchers and linguists. This target register needs to be fully described in terms of linguistic characteristics to strengthen the distinct identity of Pakistani academic writing as a register. The present research strives to explore linguistic variation across research sections of Pakistani academic writing as a register along with five new textual dimensions explored through the technique of Multidimensional analysis (Azher & Mehmood, 2016). The research is based on the corpus of 235 M. Phil and PhD research dissertations taken from different universities all over Pakistan. The corpus was further divided into five research sections and was tagged for 189 linguistic features. The ANOVA results on variation among research sections indicate that there lie statistically significant differences among research sections of Pakistani Academic Writing on all the new textual dimensions.

Keywords: language variation, academic writing, research sections, multidimensional analysis

1. Introduction

Pakistani English has emerged as a non-native variety which exhibits variation at different levels of language. Researchers have shown escalating and burgeoning interest in its exclusive and unique features over the last two decades. Most of the studies have been conducted on lexical, phonological, morphological and syntactic aspects of Pakistani English (PE) where individual linguistic items from different texts have been the focal point (e.g., Talaat, 1993, 2002; Baumgardener, 1998, 1987; Mehboob, 2004; Mehmoo, 2009; Mehmood 2009). These researches have contributed in the process of codification and the recognition of Pakistani English as a legitimate variety.

With the concept of language variation, it has become utmost important to analyze linguistic patterns across register. Academic writing like other registers in Pakistan is an area that still seeks the attention of the researchers and linguists. As for the learners, academic writing is the most important register on which their academic career depends. This target register needs to be fully described in terms of linguistic characteristics to develop appropriate teaching materials and methods. Therefore, the present research strives to explore linguistic variation across Pakistani academic writing as a register.

The most important condition which is indispensible for any register study and in its absence any register study will be unscientific and invalid is the idea of co-occurrence of linguistic features. Biber practically operationalized the concept of sets of co-occurring features in his 1988 multidimensional analysis. Co-occurrence of linguistic features refers to the clusters of associated features having a tendency to occur together in a particular register.

The multidimensional analysis is based on the identification of the sets of co-occurring linguistic features through statistical factor analysis and then interpretation of these sets of co-occurring features in terms of their shared communicative functions termed as dimensions. The textual dimensions established through multidimensional analysis are quantitatively established through factor analysis. The linguistic content is further associated with functional aspects. The textual dimensions are not discussed on their extreme edges, nor is it that

each dimension qualifies only one variety or text, rather they are overlapping and exist on a continuum. So, it is very much possible that any text may be similar on one dimension and different on another. 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 different versions of Multidimensional analysis, both perform different functions and attain different objectives. The first version stands for Biber's 1988[8] factor analysis where the researchers are mainly using the established dimensions to study variation in other registers. New MD is based upon the generation of new dimensions on the bases of a different corpus of texts. Dimensions are identified and labeled on the basis of the functional interpretation of sets of co-occurring linguistic features with significant frequencies in texts. It is important to mention here that the co-occurring patterns underlying dimensions are identified quantitatively through statistical factor analysis. The present research is based on the exploration of linguistic variation across research sections along with new textual dimensions explored on the basis of new factor solution (Azher & Mehmood, 2016).

The present research is based on the corpus of 235 M. Phil and PhD dissertations from different universities all over Pakistan. The dissertations are further categorized into five research sections: Introduction, Literature Review, Research Methodology, Results and Conclusion. The use of Multidimensional analysis will increase our understanding of linguistic variation in academic dissertations of university students across research sections recognized as categories for the present research.

Unlike previous studies on Pakistani English which are mainly based on the individual occurrence of linguistic items, this study focuses on the co-occurrence of linguistic features and augment our understanding about the linguistic features of academic writing and the their functional dimensions come up on the basis of new factor solution. Thus the present research seeks to answer the following research question.

How far Pakistani academic writing is linguistically different across research sections along the new textual dimensions?

1.1 Review of Related Literature

Although all research sections of academic writing move around a single major purpose, yet researchers have identified noticeable linguistic variations across research sections. Researchers have found significant differences in the use of multiple linguistic features and that each section represents distinct co-occurring patterns. Kanyarat Getkham (2011) investigated co-occurring patterns of linguistic features of research articles of applied linguistics across sections by employing multidimensional analysis. The corpus was consisted of 60 research articles taken from five applied linguistics journals, 12 articles representing each journal. Findings indicated that there were six co-occurring patterns which were named as follows: (1) Established Knowledge/Expression of Ownership, (2) Expression of Purposes, (3) Evaluative Stance, (4) Expression of Generality, (5) Framing Claims, and (6) Conceptual Complexity. Dimensional differences were found among most research sections. However, there were no differences between Introduction and Method sections as well as between Results and Discussion sections.

Biber & Finegan (1994) also worked on the research sections of articles and compared the multidimensional profiles of the Introduction, Methods, Results, Discussion sections in medical research articles. Some other studies have examined the functions and types of hedges in different sections of research articles, in various languages and disciplines and in both soft and hard sciences (Crompton, 1997; Falahati, 2007; Getkham, 2010; Lin & Liou, 2006; Vassileva, 2001).Many other studies have identified the distribution of linguistic features across research sections. For example, Hanania & Akhtar, 1985 on biology, chemistry and physics masters theses discovered more frequent use of modals in introduction and discussion sections as compared to other sections of research theses. Swales (1990) in his appraisal of studies of articles sections observes that introduction and discussion sections are characterized by more complexity and more variation and broader focus; whereas, method and discussion sections are viewed as simpler with narrow and specific focus. The studies show there is patterned diversity in the distribution of linguistic features and they have certain unified function.

The present research is based on the exploration of linguistic variation among research sections of Pakistani academic writing along with five new textual dimensions discussed as under.

Dimension 1: **Interactive Expression vs. Informational Discourse**

Dimension 1 is labeled as Interactive Expression vs. Informational Academic Discourse. This is the most powerful dimension as it comprises of 27 positive and 6 negative linguistic features. The two poles represent interactive and involved expression on positive side and informational discourse on negative side. Among the

most distinguishing features with highest positive weight on Dimension 1 are stance verbs co-occurring with private verbs, verbs expressing desire, mental verbs, the stange all, communication verbs in other context, and Wh all, and all verbs. The verbs further co-occur with complement clauses, discourse particles, and first person pronoun on positive pole. Features with negative loading include preposition, human nouns, attributive adjectives, nouns of place and word length.

Together, both positive and negative features lead to the interpretation of dimension 1of Pakistani academic writing as (+) Interactive Expression Vs. (-) Informational Academic Discourse.

Dimension 2: Contextualized Description vs. Detached Reference

Dimension 2 of Pakistani academic writing is labeled as Contextualized Description vs. Detached Reference. This dimension is also very important in that it is marked by 17 positive and 3 negative linguistic features on factor loading. On the positive pole, this dimension is predominated by the co-occurrence of coordinating and subordinating conjunctions, factive adverbs, adverbials, emphatics and nominal and demonstrative pronouns. Adverbs and conjunctions generally describe circumstances relating to actions, processes and states denoted by verbs. Their co-occurrence refers to the circumstantial and contextual stance of Pakistani academic writing.

Features with negative loading include nn_all, proper noun, passive_post-nom and common nouns. Proper nouns serve as referents to entities, whereas passive constructions mark detached and impersonal attitude. On account of its co-occurring features, dimension 2 of Pakistani academic writing is labeled as Contextualized Description vs. Detached Reference.

Dimension 3: Informal vs. Formal Academic Discourse

Dimension 3 like all other dimensions of Pakistani academic writing has two opposite and mutually exclusive sets of features and is characterized by both positive and negative features on polarity. Surprisingly this factor has more features on negative polarity as compared to positive side. On the positive pole, present progressive verbs with the largest weight frequently co-occur with place adverbials third person pronouns and preposition final. Other features with positive loading include contractions, adverbial hedges, phrasal verbs activity intransitive, phrasal verbs activity transitive, concrete nouns, action verbs, exist verbs.

Features on negative pole are amplifier, th_verb, split_auxiliary, nn_nominal, passive short, all passive, all wh relative clauses, stance nouns +preposition p, stance nouns in other context, new stance nouns, th_verb_all, process nouns. The negative pole is characterized by all features which make academic writing more formal and extended.

Dimension 4: Narrative Discourse vs. Other Concerns

Dimension 4 offers both positive and negative factor loading on two poles. The positive pole is characterized by the co-occurrence of past verbs with perfect verbs and coordinating conjunction phrases. Immediate to past verbs are perfect verbs, which are further co-occuring with other occurrence and aspectual verbs along with Wh words functioning as subject. Occurrence and aspectual verbs along with Wh relatives as subjects and conjunction phrases can be grouped to narrative function of past verbs to report about activities and events commonly held in past.

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 other concerns of Pakistani academic writing, other than narrative discourse.

Dimension 5: Personal/ Evaluative Stance vs. Technical Description

Dimension 5 is predominated by adjectives on positive pole. Adjectives are linked to nouns as their major function is to modify nouns. Adjectives describe quality of both animate and inanimate nouns and add into the informational density. The features include attitudinal adjectives in other context, attitudinal verbs in other context, all adjectives, predictive adjective, suasive verbs, stance nouns in other context.

The frequent co-occurrence of attitudinal adjectives and verbs reveals subjective opinion and evaluation based stance of the writer. Attributive adjectives along with predicative adjectives and stance nouns further strengthen the view of Pakistani academic writing as having evaluative stance as well.

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. Technical nouns are used to describe related topics and concepts. Definite articles are used for specific reference. Technical nouns along with definite articles refer to the description of specific related concepts. These features with negative scoring characterize Pakistani academic writing with technical descriptive style.

2. Method

2.1 Collection of Data and Corpus Compilation

The first step in building a representative Corpus of Pakistani Academic Writing (COPAW) was to select disciplines that may represent a wide range of academic areas. Three major disciplines, Humanities, Sciences and Social Sciences due to their importance in academics were then selected to study. The research theses represent a wide array of subjects in Humanities, Social Sciences and Sciences. 235 theses in total were finally collected to build up a corpus of Pakistani academic writings. Each thesis was further divided into research sections as sub-categories and was duly coded. The corpus finally was compiled of 1175 text files on the bases of sub-categories. Finally, a corpus of 8.385000 million words was ready for further data analysis process.

The following table describes the categories of Pakistani Academic writing to be studied in the present research.

Table 1. Sub-categories of Pakistani academic writing

Sr. No	Sub-Categories of Pakistani Academic Writing	Codes
1	Introduction	Int
2	Literature Review	Lit
3	Research Methodology	Met
4	Results	Res
5	Conclusion	Con

As the table shows Pakistani academic writing was divided into five major categories to build up a special purpose corpus and to explore linguistic variation across these categories.

As far the situational characteristics of the research sections, Introduction is concerned with introducing the rationale and objectives of the study. Literature Review presents a detailed account of previous related studies, whereas, research Methodology focuses on the account of materials and methods taken in the research study. The section on Results is concerned with the findings of the study, while Conclusion reports summary and suggests future implications.

2.2 Data Analysis

The data analysis in the present research has gone through four major steps: tagging for linguistic features of Pakistani academic writing, taking raw counts of linguistic features, turning them into normalized frequencies, counting of dimension scores and conducting multivariate ANOVAs for finding statistically significant differences among research sections as sub categories of Pakistani academic writing.

2.2.1 Tagging of the Corpus

The corpus of Pakistani academic writing after being arranged according to categories was tagged using Biber's tagger. The data was tagged by Jesse Egbert where he tagged 189 linguistic features including those tagged in 88 MD analysis along with many later tags included by Biber. Detailed explanation of these features is available in Biber (1988) and Longman Grammar of Spoken and Written English (Biber et al., 1999).

2.2.2 Computing Raw Counts of Linguistic Features and Converting into Normalized Frequencies

Biber's tag count program was used for the raw counts of the frequencies of different linguistic features and normalized frequencies. The raw frequencies of linguistic features were obtained from all texts (1175) and computed out of 1000 words. This normalization was highly essential for comparison of frequency counts across texts due to variation in the length of texts. "A comparison of non-normalized counts will give an inaccurate assessment of the frequency distribution in texts" (Biber, 1988, p. 75). This standard was set by Biber in his 1988 study on the basis of the formula: actual frequency divided by total number of words, multiplied by 1000.

2.2.3 Calculation of Dimension Scores

The dimension score of each text of Pakistani academic writing was calculated by subtracting the standardized scores of negative features from the sum of standardized scores of positive features. The dimensions with no negative features include only sum of positive scores of linguistic features. In this way, dimension score of each text of Pakistani academic writing was calculated.

2.2.4 Analysis of Variance

In order to find out the statistically significant differences among research sections of Pakistani academic writing, Two-factor ANOVA was carried out in SPSS.

3. Results

Table 1. Analysis of variance for variation across research sections of Pakistani academic writing on new dimensions

Dimensions	Introduction	Literature Review	Methodology	Result	Conclusion
D1	-6.2±0.53A	-7.1±0.56A	-1.1±0.74A	-7.9±0.58A	6.6±0.58C
D2	-16.9±1.19C	23.8±1.12C	-17.6±1.19B	-18.2±1.23B	-15.1±1.13A
D3	-9.3±0.29B	-6.2±0.27A	-9.7±0.30C	-5.2±0.24C	-6.5±0.28B
D4	-8.3±0.47AB	-6.9±0.50A	-6.1±0.52D	-7.7±0.53A	-6.8±0.51B
D5	-6.6±0.77A	6.4±0.73B	3.1±0.67E	4.9±0.64D	6.3±0.77C

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

The table shows that there lie statistically significant differences among research sections of Pakistani Academic Writing on all textual dimensions.

4. Discussion

The ANOVA results on variation among research sections indicate that there lie statistically significant differences among research sections of Pakistani Academic Writing on all the new textual dimensions. Thus it is going to be interesting to note how far the research sections are similar or different on new textual dimensions.

4.1 Variation among Research Sections on D1

The ANOVA results on D1 indicate that there are statistically significant differences among research sections of Pakistani academic writing on D1 of new MD analysis. Figure given below draws a comparison among the research sections of Pakistani academic writing on D1 and indicates that all the research sections except Conclusion on D1 have negative dimension scores. The negative dimension scores on D1 represent informational academic stance, whereas, positive scores stand for interactive stance of Pakistani academic writing.
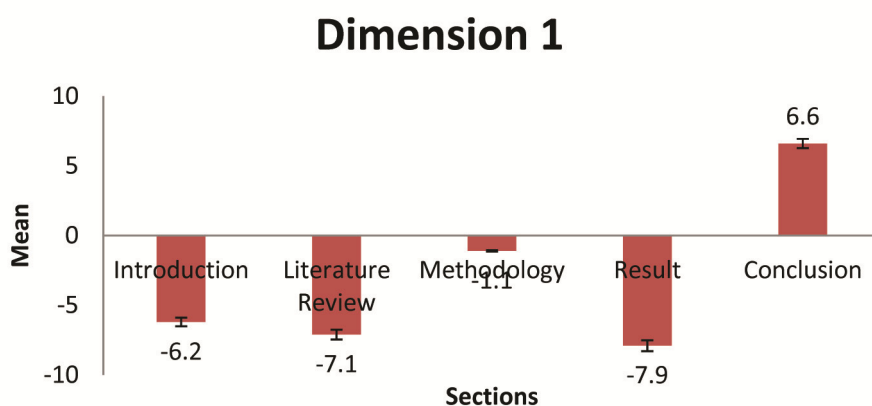

Figure 1. Comparison among research sections on D1

The figure above indicates that among all, the section on Results (-7.9) has been revealed the most informational one in the production of academic discourse whereas, Methodology section is interestingly found to be the least informational with the minimum mean score of -1.1. On the other hand the section on Conclusion has been found highly interactive rather than informational with positive mean score of 6.6.

The variation among research sections can further be explored through the distribution of linguistic features associated with the informational stance. The negative features like nouns, preposition, attributive adjectives and word length on this dimension serve the purpose to generate information. The figure given below displays the distribution of the features across research sections on this dimension.
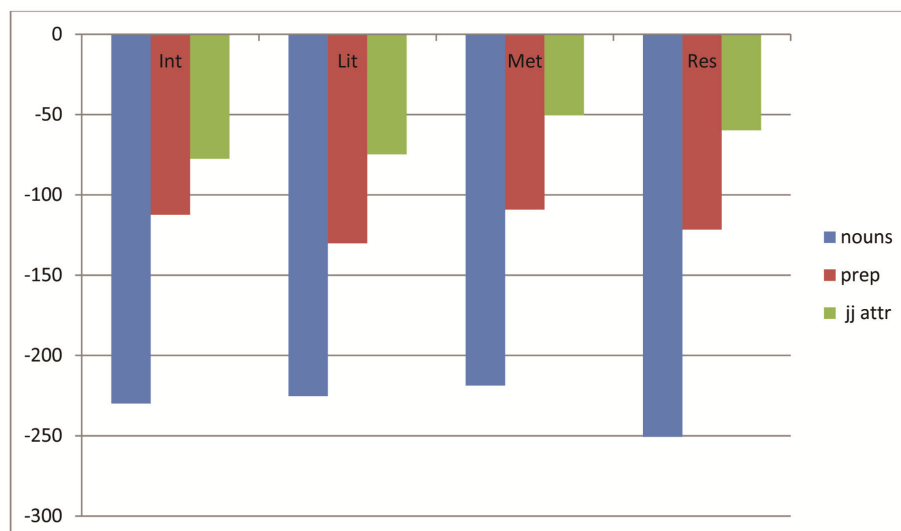
Figure 2. Comparison of informational features across research sections on D1

The figure displays a comparison of the linguistic features across research sections on Dimension 1 and reveals what makes Results the most informational section is the highest frequency rate (mean score-250.5706) of nouns. This clearly manifests the focus of Results section on the description of entities. Attributive adjectives with the highest mean score of -147.0517433 are most frequently occurring in the section on Literature Review, which exhibits the evaluative stance of this section in presenting information about related studies. The negative features of D1 of the present study are closely aligned with Biber's 1988 D1.

The following example from the section of Results clearly depicts the informational stance of Pakistani academic writing.

Example: 1

"Result and **interpretation of data** are **the most important step in scientific research**. **Without these steps generalization** and **prediction** con not be achieved, that is **the target of scientific research**. **Generalization** and **conclusion** are drawn **on the basis of characteristics** and **attitude of the respondents**. Therefore, **this chapter** presents **the required data analysis."** (Text 34. Results, H)

The above given example exhibits the density of nouns, prepositions and attributive adjectives and reveals highly informational stance of Pakistani academic writing. However, the section on Conclusion has been found highly interactive with plenty of stance, communication and modal verbs. The below given example from the section on Conclusion illustrates the interactive stance of this section.

Example: 2

"Potentials of Cooperative Learning **should be utilized to enhance** quality or education in general and science education in particular. On the basis of above findings, it **is strongly recommended** that scienceeducators **should adopt** cooperative learning as an effective method in order **to improve** student's academic achievement and self esteem. It **is also recommended** that flexible arrangement of seats **be provided to minimize** the transition time." (Text 149, 5, SS)

The example given above reveals the interactive stance of the section on Conclusion. The main function of modals is to express stance and are generally more common in conversation. Stance verbs tell the feeling and attitude of the writer towards the idea.

The informational and interactive stance can be associated with the purpose of different research sections of Pakistani academic writing. Academic writing involves careful production in terms of editing, revising, and rewriting. That results into specific lexical and syntactical choices and an integrated package of information.

4.2 Linguistic Variation across Research Sections on D2

ANOVA results display that there lie statistically significant variation among all research sections. Group wise comparison indicates that Introduction, Literature Review and Conclusion are significantly different from

Methodology and Results sections. On D2 all the research sections except Literature Review have negative dimension scores and are found to be detached, uninvolved and impersonal. Whereas, the section on Literature Review is revealed to be highly dependent on the context. The figure given below illustrates the variation among research section on D2.
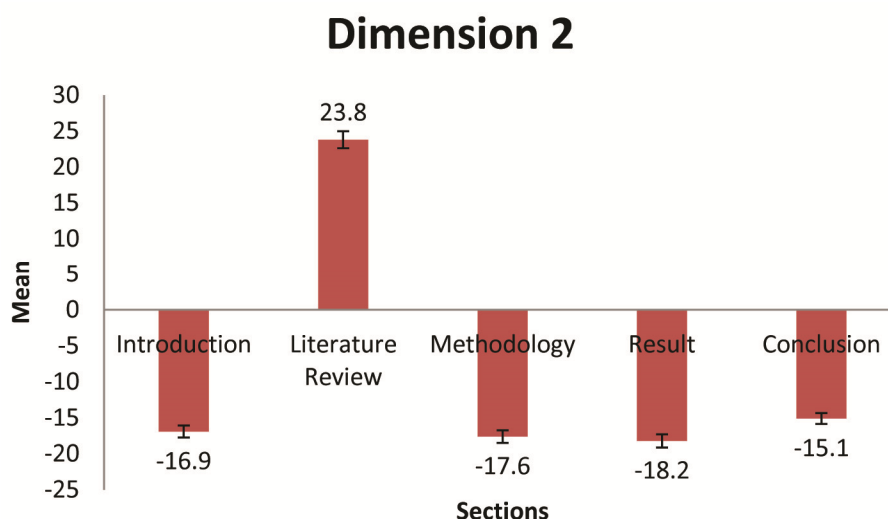

Figure 3. Comparison among research sections on D2

The figure reveals that the section on Results is the most detached and impersonal with the highest negative mean score (-18.2) on this dimension. Conclusion has been found the least detached section with the mean score of -15.1 and is comparatively inclined towards contextualized discourse. Next to the Result section are Methodology and Introduction in being highly detached and impersonal with mean score of -17.6 and -16.9 respectively. Interestingly, Literature Review with high positive dimension score of 23.8 has been revealed greatly context dependent section. The Results on D2 can be related to the purpose of different sections. That the section on Literature Review has been found situation dependent is understandable as the writers have to pack related information in the very context of the study taken up. The section on Results has been found highly detached due to its concern with the neutral presentation of the findings of the study.

Contextualized writing is characterized by conjunctions and adverbials ((Biber, 1988; and Biber et al., 1999) whereas, nouns and passive indicate an impersonal and detached style of writing.
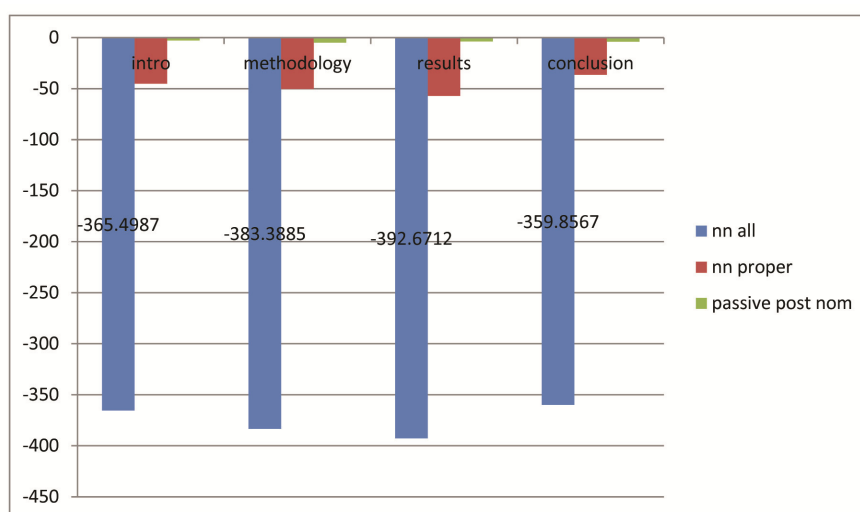

Figure 4. Features of detached reference across research sections on D2

The figure illustrates the comparison among features of detached reference across research sections and reveals that nouns as nn-all (392.6712) and proper nouns (57.21017) have been found most frequently occurring in the section of Results. Whereas, passives at post nominal place (4.89063) are the most common features of Methodology section. Nouns are used to refer entities and objects whereas, "the extensive use of passives gives a sense of objective detachment in expository prose". Biber et al. (2002, p. 168). The example given below exhibits the extensive use of nouns along with passive constructions giving a sense of detachment in Pakistani academic writing. Features of detached reference are highlighted in bold.

Example: 3

Twenty different **types** of **plants were collected** from the different **sites** of **Soon Valley** using sterilized **apparatus.Jahlar Lake, Amb Temples, Akrand Cliff Fort Naushahra Village, Uchhali Lake and Khabeki Lake** were the **sites chosen** for **plant** collection.**DiluteHCl was used** to wash **the plants**. Then air dried **samples were sealed** in **paper bags** and **labelled**. Afterwards **samples were subjected** to heat drying in **oven**. **Wet digestion method proposed by (Richard, 1968) was used** to digest **the oven dried plants samples**. (Text 178, Methods, S)

4.3 Linguistic Variation across Research Sections on D3

ANOVA results indicate that there lie statistically significant differences among all the research sections. The results on D3 reveal that all research sections have negative mean scores and have been found highly formal in the production of academic discourse. The figure given below reveals that the section on Methodology with the highest negative mean score of -9.7 has been found the most distinctive section among all in producing the most formal discourse. The section on Results which has been found the most informational and detached on the D1 and D2 respectively is found to be the least formal with minimum mean score of -5.2 on D3. The sections on Conclusion and Literature Review have the mean score of -6.5 and -6.2 respectively on this dimension and are shown to be producing less formal academic discourse than Methodology and Introduction.
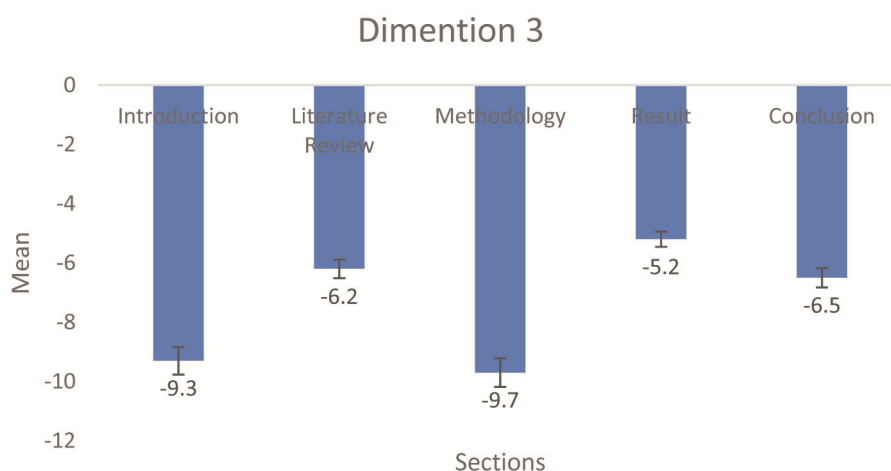

Figure 5. Comparison among research sections on D3

The formal style of Pakistani academic writing may be associated with very situation in which research dissertations are produced. Thesis writing is a highly formal activity and is done in a formal academic situation.

For variation across research sections, the differences in purposes seem to be important. It is understandable that the section on Methodology is constructed to give research design and to structure the research to show its major parts. Research procedures tend to be formally named, so are proper and formal. Method section, therefore, is inclined to use more process nouns along with nouns, passive structures and amplifiers for embellishment. Consider, for example the below given figure that stretches out the comparison among features of formal discourse across research sections.
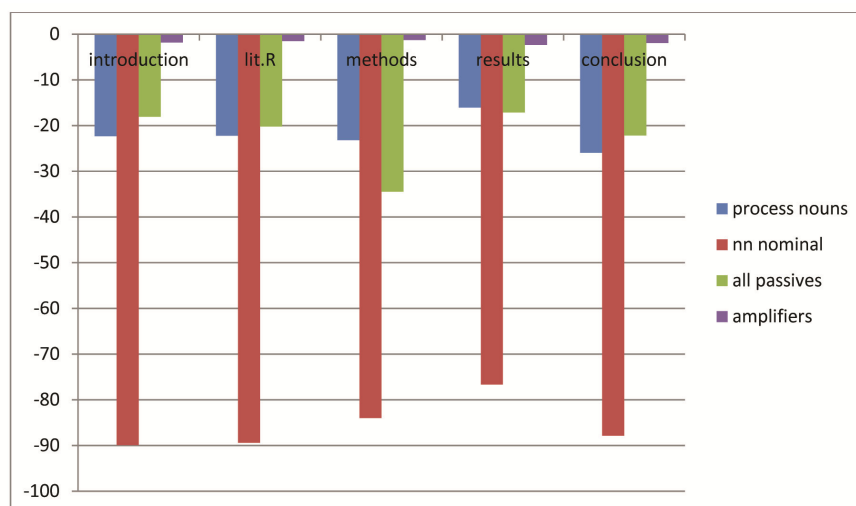
Figure 6. Features of formal discourse across research sections on D3

The figure exhibits comparison of the linguistic features across research sections on D3. The features associated with the D3 appear to be associated with the purpose of different research sections. The section on Introduction uses the highest frequency of nominalization -89.93702 to add into the importance of the issues being raised in the study. The section on Methodology is characterized by the highest frequency of all passives with the mean score of -34.47915 and with a great deal of process nouns (next to conclusion with mean score -23.18851) to report procedures objectively and formally. Process nouns with highest mean score -25.9671 are the most common linguistic feature in the section on Conclusion that is mainly designated to summarize the findings of the study.

The following example from the Methodology section exhibits the co-occurrence of the linguistic features of formal discourse on D3.

Example: 4

> **"They were assured** that the **routine activities** of the **children will not be disrupted drastically** as a **result** of the **research process**. After **getting permissions** form the **administration, participants were conveniently selected**. The **whole process was carried out** on one to one **basis**. An **attempt was made** to get separate **room** for the **administration** of **research tools** which was not possible in some **cases** of home-living **children."** (Text, 114, 3. S)

The example above exhibits the features of formal discourse highlighted in bold. The example reveals a cluster of passives, nominalization, process nouns, and amplifiers, thus making Pakistani academic writing a formal discourse.

4.4 Linguistic Variation across Research Sections on D4

The ANOVA results on D4 indicate that all research sections have statistically significant differences among them. Pair wise comparison shows that Introduction and Conclusion are significantly different from other research sections. Methodology and Results are significantly different from the other three sections, whereas, Literature Review is significantly different from all the other research sections. Over all, all the research sections are characterized by other than narrative concerns. The figure below displays the mean dimension scores across research sections of Pakistani academic writing.
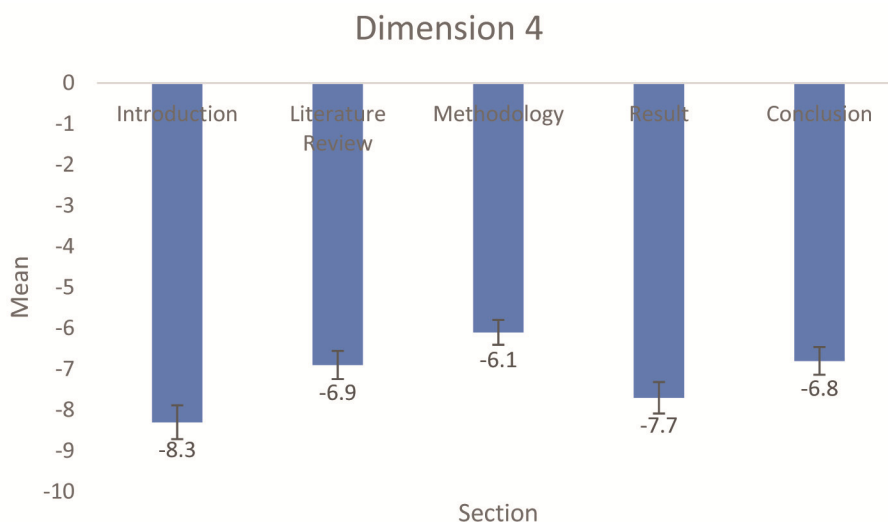
Dimension 4

Figure 7. Comparison among research sections on D4

The figure compares the mean dimension scores across research sections on D4 and reveals that the section on Introduction with highest mean score of -8.3 enjoys the most distinctive position in Pakistani academic writing in producing highly non-narrative discourse. Introduction is designated to introduce the topic and its significance to the reader and is found understandably descriptive in nature. Methodology is the least non narrative section among all with mean score of -6.1 and is inclined towards narrative discourse which is justified as the procedures of the study are narrated in the past tense. The section on Results with mean score of -7.7 is next to Methodology in being non narrative which is understandable as the Results are concerned with presentation of findings. The sections on Literature review and Conclusion are comparatively less non narrative and more narrative with mean score of -6.9 and 6.8 respectively. Literature Review sketches down previous related researches and Conclusion summarizes the study taken up, thus are bit inclined towards using narrative discourse in comparison with Introduction and Result sections.

The linguistic features which characterize this dimension include present tense, "have" verbs, nouns as pre-modifiers, and 2nd person pronouns. The figure given below exhibits the comparison among linguistic features of D4 across research sections of Pakistani academic writing.
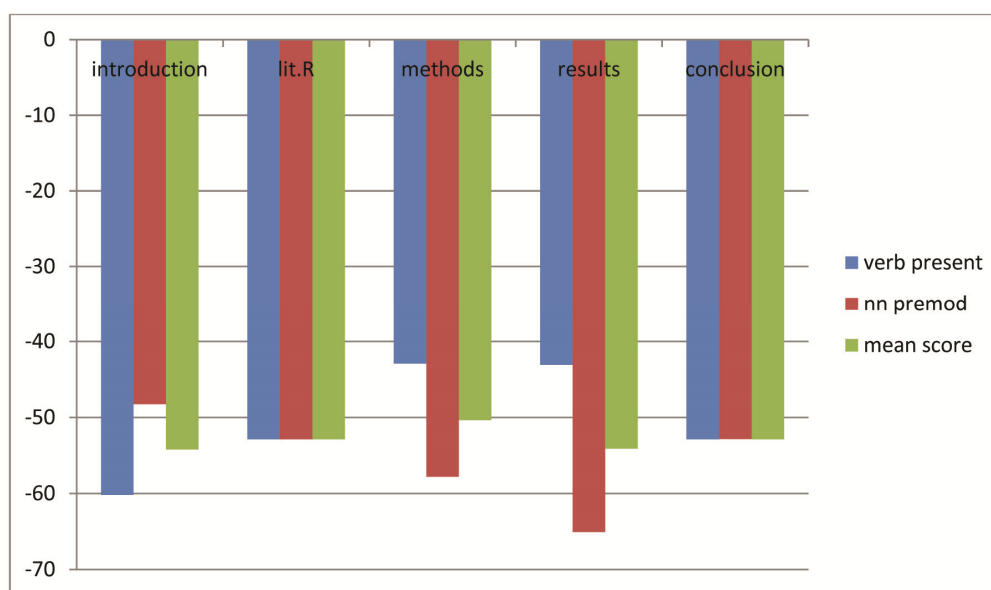

Figure 8. Features of non-narrative discourse on D4

The figure above illustrates the use of present verbs and pre-modifying nouns across research sections on D4. The figure reveals the highest frequency of present verbs (-60.17872) in the section on Introduction which makes Introduction as the most non narrative section among all. Present verbs are used to describe immediate situations and state of actions happening at the present time. Whereas, nouns as pre-modifiers (-65.08517) are most frequently occurring in the section on Results. Noun +noun combination is very productive type of noun and pack a plenty of information into small spaces. "Noun+noun sequence conveys a complex meaning in condensed form" (Biber, Conrad & Leech, 2006, p. 275). Nouns in combination with present verbs are used to present information about the current state of affairs. The section on Methodology is shown to be using the minimum amount of present verbs (-42.91574) and is more inclined towards narrative style which is understandable as per the purpose of the section. The section on Introduction being the most non narrative on this dimension employs the minimum frequency of pre-modifying nouns (-48.25957), thus focusing more on current actions rather than entities and objects.

The following example from Introduction section is exhibits the non -narrative style of Pakistani academic writing.

Example: 5

> "Traditionally it **is based** on **polyculture system** using indigenous carps which gained popularity in **fish farming** due to their number of traits such as **culture suitability** in captive conditions and good growth in pond. In Pakistan **fish farming is** practiced in the **Punjab, Khyber Pukhtoonkhawa and Sindh provinces** on a limited scale. During recent years the government of Pakistan **has announced training services** and established some **fish hatcheries** for **fish farmers**. About 13000 **fish farms have** so far **been established** across Fisheries and **Aquaculture Department** Pakistan 2010." (Text 235, 1, S)

The example exhibits density of present verbs as well as noun+noun combinations that shows the non narrative style of Pakistani academic writing.

4.5 Linguistic Variation among Research Sections on D5

ANOVA results of linguistic variation across research sections on D5 indicate that all research sections have statistically significant differences among them. All the research sections have positive mean dimension scores except the section on Introduction which has negative mean score (-6.6) on this dimension. The figure below displays the mean dimension scores across research sections of Pakistani academic writing.
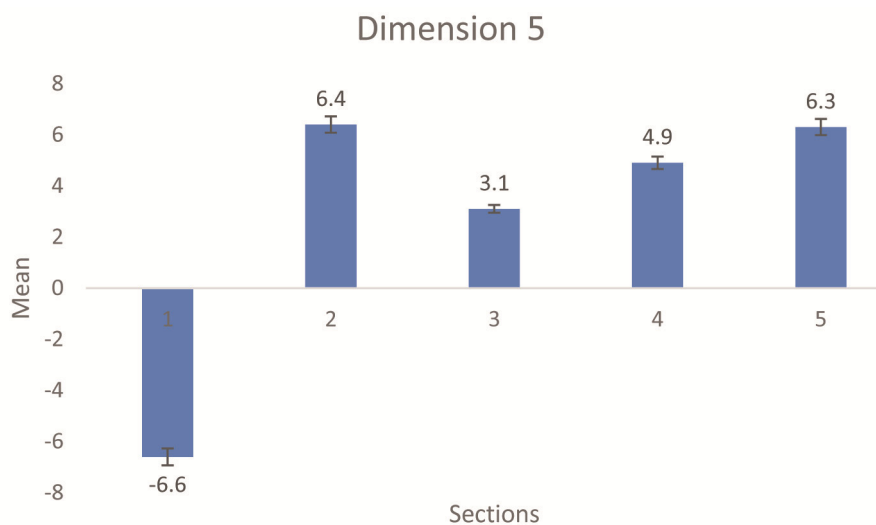

Figure 9. Comparison among research sections on D5

The figure above illustrates the comparison among the research sections of Pakistani academic writing on D5. The figure above indicates that among all Literature Review enjoys highly distinctive position in producing the most evaluative discourse with the highest positive mean score of 6.4.With a slight difference of mean score is the section on Conclusion (6.3) that is characterized by evaluative stance on positive pole. Methodology with the mean score of 3.1 has been found least evaluative in stance and is comparatively inclined towards technical

description. The section on Results has the positive mean score of 4.9 and has been found less evaluative than Literature Review and Conclusion but more than Methodology section on this dimension.

The section on Introduction has been found distinct among all for being placed on the negative pole and characterized by the technical description; whereas, all the other sections have been found on opposite extreme and are evaluative in discourse.

The positive linguistic features associated with this dimension are adjectives including attitudinal, predicative, predicative attitudinal and all adjectives along with attitudinal and suasive verbs , whereas, the negative features are technical nouns with definite articles and group nouns. The figure below exhibits the distribution of linguistic features of D5 across research sections.
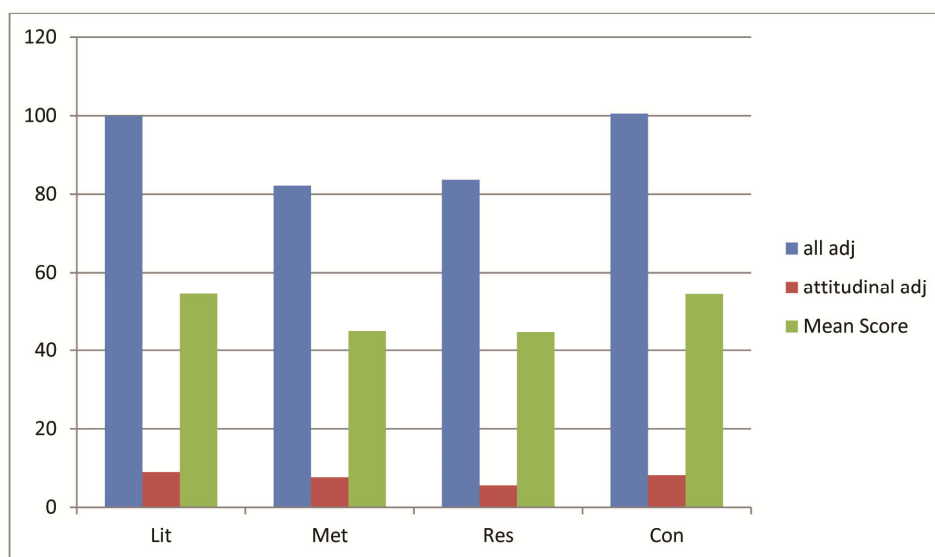

Figure 10. Features of evaluative stance across research sections on D5

The figure exhibits the density of linguistic features of evaluative stance across research sections and reveals highest frequency rate of attitudinal adjectives along with all types of adjectives in the section on Literature Review.

The following example from the section on literature review exhibits the evaluative stance of Pakistani academic writing.

Example: 6

"Re-establishment of judiciary and **long** march **to restore** judiciary was **very important t**opic. Beside **different** facet of the issue, **public** support makes **judicia**l restoration **more important and successful**. Therefore media gave **highest** coverage to issue." (Text 2, 2, H)

There are certain reasons for the evaluative stance as a distinguishing feature of the last four sections in Pakistani academic writing. The section on introduction opposite to other sections is characterized by technical description as the topic and issues being taken are introduced and rationalized. The section on methodology is shown to be the least evaluative and comparatively inclined towards technical description as this section is very much focused on the description of technical procedures and methods. The major purpose of literature review is not a mere presentation of the summaries of previous related studies but to discuss these studies through analytical and evaluative perspective and to find out the spaces for further studies.

5. Conclusion

The foregoing discussion on linguistic variation across research sections of Pakistani academic writing on new MD analysis reveals that all the research sections have statistically significant differences and are found to have some interesting results on five new textual dimensions. On D1 the section on Results with high density of nouns has been found the most informational, whereas, the section on Methodology is interestingly revealed the least informational. The section on Conclusion as on opposite pole has been found highly interactive with the readers

having plenty of verbs of communicative stance. On D2 of new textual dimensions, only the section on Literature Review has been found context dependent; whereas, the other sections have been found detached, uninvolved and impersonal. Among the detached sections, the one on Results has been found the most detached and impersonal; whereas, the section on Conclusion has been found the least detached section. This clearly speaks of its inclination towards presenting context dependent discourse. On D3, all the research sections have been found to follow a formal pattern of discourse with certain differences in the degree of formality. Interestingly, the section on Results has been found the least formal, while, the section on Introduction has been manifested as the most formal one among all relying on nominalizations and amplifiers more than other research sections. On D4, all the sections are found characteristically to be non- narrative. The section on Introduction has been revealed the most non narrative one with density of present verbs in describing the rationale of the study. The section on Methodology has been found the least non narrative due to its focus on the description of steps and procedure involved. The last dimension of the present study reveals all the research sections except Introduction as highly evaluative due to reliance on density of adjectives. The section on Literature Review has been found the most evaluative, while the one on Methodology has been revealed least evaluative among the four sections.

The research sections on new MD analysis have been found to follow distinct characteristics and norms which may be associated with the purpose behind each research section. On three of the five new textual dimensions, the research sections of Pakistani academic writing have shown non unified results and have been found to have opposite clusters of linguistic features

On further exploration of linguistic features, the research sections of Pakistani academic writing have been marked with the dense presence of nouns, present verbs, nominalizations, nouns as pre-modifiers, passives, conjunctions, adjectives and communicative verbs. Categorically mentioning, the findings show the fact that Pakistani academic writing is characterized by highly informational, detached, formal, non-narrative, and evaluative discourse. Moreover, the dense presence of distinct linguistic features speaks of the distinct existence of Pakistani academic writing register with its own norms.

These variations among different research sections have been associated with the purpose of each research section. The results seem justified as they are in accordance with the nature of the contents of each research section and the purpose behind each section.

The present research may help out future researchers on register variation in Pakistani English, syllabi designers, ESP practitioners, teachers, textbook writers, copy-writers in numerous ways.

The results of the present study may be taken as norms of Pakistani academic writing and may be compared with other registers of Pakistani English. The results of MD analysis of the Pakistani academic writing can also be compared with the prospective studies on the language of other genres of academic writing like the language of text books, journals etc.

The existing syllabi on the language for academic and specific purpose need much guidance regarding the language of academic English and its nature of linguistic characteristics. The results of the present study will be of a great help to syllabi designers of books on academic writing by giving the practical insight into the usage of linguistic items in Pakistani academic English. The syllabi of academic writing may be set by taking practical examples from the present study regarding the different linguistic items found in the different categories of Pakistani academic writing.

The corpus of Pakistani academic writing can be used to prepare valuable material for copy-writers. It can be used to recognize the lexical packages and make lists of nouns, adjectives, adjuncts, conjunctions and verbs and many other grammatical features. In addition, a small dictionary based upon the vocabulary items like, adjectives, adverbs, nouns, adjuncts and verbs of language of academic writing can be produced with the different available software like Antconc or Wordsmith Tools.

The present MD based study on academic register makes it understandable that other Pakistani non-native registers 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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