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Application of Multidimensional Analysis on Covid-19 related Editorials of The Nation

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Abstract
Aim of this study is to evaluate the strategies of editorials' texts written during Covid-19. In order to fulfill the said purpose, The Nation was selected through purposive sampling technique which was employed to select this newspaper that has wide readership and it is available online as well. 198 editorials specifically addressing Covid-19 issue were gathered to form a corpus. For the analysis, Biber's multidimensional model 1995 was utilized. After selection and compilation, data was tagged through MAT Tagger. The raw data obtained after tagging was further processed using factor analysis. The five dimensions obtained showed varied patterns in closest text types these include broadcasts, personal letters, conversations, official documents, and academic prose. The results in form of mean values of linguistic features, tables and graphs revealed that the collected corpus is written in abstract manner that contains linguistic features which perform the function of provides information in overtly, and explicitly in a narrative style.
Keywords: MAT Tagger, The Nation, multidimensional model, editorials, Covid-19

1. Introduction

Biber (1988) introduced a new approach for systematic description of a wide range of genres in both spoken and written English. He used computer based automatic identification techniques to tag eminent syntactic and lexical features. He created a method to form functional dimensions from co-occurring patterns of linguistic features. In addition to identify types of texts closest to each dimension, the co-occurrence of linguistic features also identifies their common communicative function. Moreover, complementary distribution of linguistic features helped label the dimension according to the continuum which the linguistic features having positive and negative loadings formed.
Biber's Old MD marks 67 linguistic features separately. The five textual dimensions created help in pointing out the underlying meanings of the texts as well. Initially he proposed this model to identify textual variation among speech and writing. However, this model is used in the present study to evaluate text type, dominant linguistic features and their communicative functions regarding Covid-19 scenario.

1.1. Research Question

How the application of Biber's multidimensional model can be used to evaluate distribution of text types and linguistic features in five dimensions in the editorials of The Nation?

2. Literature Review

It is observed that Covid-19 has a great impact on the usage of language as many studies have been conducted during and after that time related to linguistics. Research of Idda, and Sofi (2020) was also one of them. They focused on the usage of adjectives in those academic writings which were written on the theme of Covid-19. For that mixed method research, twenty academic writings were selected as corpus. Then they pointed out only those adjectives which were used to describe the situation of Covid-19. Current research has not pointed out adjectives only in the editorials rather it talks about other linguistic features too which have been used to describe the situations related to Covid-19. Research of Ahmad and Mahmood (2016) was also on media related corpus and their analysis was through multidimensional model like current research yet there was a difference too as they have collected the corpus from print media and present study has the extracts which are available online in form of e-papers. Another difference is that they have taken data from various newspapers while here only The Nation is considered.
After a few years, another research has been conducted on print media by Ahmad and Ali (2019). Their research had much similarity with the above mentioned research as both of these researches were on print media, both have selected various newspapers, and both have analyzed their corpus through multidimensional model given by Biber. But the research of Ahmad and Ali (2019) had an additional point that they had a comparative analysis of the data they have collected from Pakistani English newspapers with British English newspapers. The comparison showed that British writings are less informational, there is less abstraction in them, and also they are not that explicit as compared to Pakistani writings.
Much resemblance of current research was observed with the study of Alvi (2017) as she too has collected editorials as corpus of her study. Those editorials were gathered from five different newspapers. All of them were from Pakistani English newspapers. Later she collected similar kind of corpus i.e. editorials but from British newspapers. On both kinds of data, multidimensional analysis was applied and the results were compared. Variations in language

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of both kinds of data were observed. Results of this study were not that much different from the study of Ahmad and Ali (2019) as this study too found Pakistani writings as more informational as well as explicit.

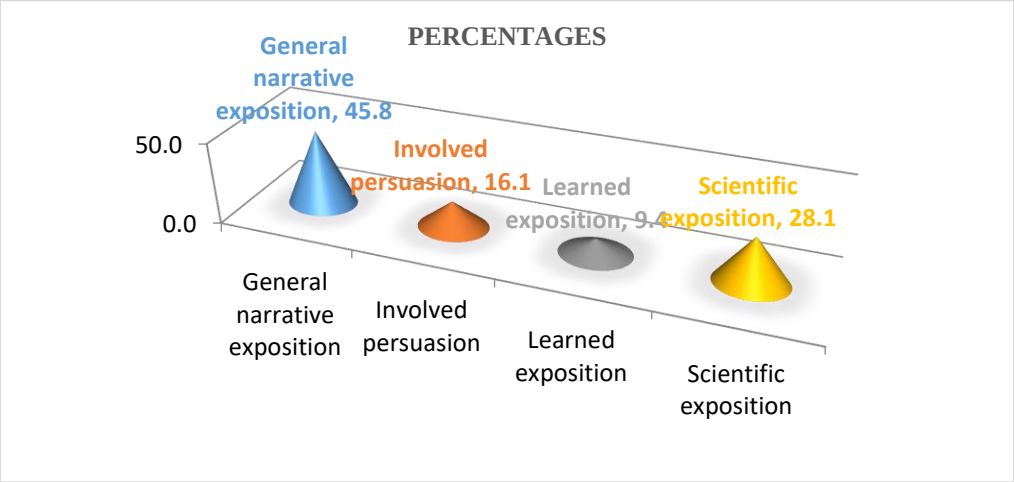
3. Methodology

This corpus study is based on Biber's multidimensional model. For this purpose a specialized corpus of editorials from The Nation (a newspaper published online and accessible worldwide) has been selected. One ninety eight editorials containing 62,719 words were considered for the study. Since the time period for under Covid-19 situation comprised of almost two years, the data considered for the present research is dated from 1st March, 2020 to 4th August 2022. The research procedure followed to conduct Biber's model involved some steps i.e. collection and compilation of specialized corpus, data tagging through MAT tagger, normalization, application of principle factor analysis, analyzing dimensional variation using factor analysis, and computation of dimensional scores.

4. Data Analysis

Biber in his multidimensional model (1988) has prescribed five labels for the five dimensions which have been studied in current research. Although he presented seven dimensions in total but five dimensions were found to be relevant with the present study. Those five dimensions along with their prescribed titles have been analyzed below. But for the analysis of the text as a whole in order to find the text types which were found to be closest to the data of this research, following figure is given. Figure 1 gives the information regarding the types of texts found in The Nation, along with their percentages. According to this figure, the dominant feature traced is general narrative exposition which is 45.8%. the exposition least observed, was learned exposition in percentage of 9.4%. However, scientific exposition and involved persuasion come in between with the percentages of 28.1 and 16.1 respectively.

Figure 1: Graphic representation of Text type Distribution



All of the linguistic features which were found in the data have been given in following table for further analysis along with their standard deviation, range, maximum value and minimum value. MAT tagger gives normalization of frequencies to compare the results and table 1 is outcome of that.

Table 1: Descriptive Statistics for the Corpus of The Nation as a whole

Linguistic Feature	Mean	Minimum Value	Maximum Value	Range	Standard Deviation
AMP	-0.3016667	-1.04	3.81	4.85	0.995209643
AWL	1.32307292	-0.22	2.8	3.02	0.530641649
CAUS	-0.21875	-0.65	4.94	5.59	0.909349632
COND	0.21505208	-1.14	5.55	6.69	1.469224249
CONJ	1.67911458	-0.75	11.06	11.81	2.440172243
DEMP	0.43375	-0.96	3.79	4.75	1.031939921
DPAR	-0.3654688	-0.52	1.04	1.56	0.429955299
EMPH	-0.0947917	-1.5	3.95	5.45	1.1519103

FPP1	-0.7405208	-1.04	0.56	1.6	0.312017149
HDG	-0.4475521	-0.46	1.92	2.38	0.171759443
INPR	-0.5706771	-0.7	2.45	3.15	0.4575762
NEMD	1.99927083	-1	10.19	11.19	2.419497263
NOMZ	1.94348958	-0.51	5.25	5.76	1.060097205
OSUB	1.92338542	-0.91	11.82	12.73	2.712105208
PHC	1.7684375	-1.26	8.37	9.63	2.025375321
PIT	0.23489583	-1.45	3.68	5.13	1.082338456
PLACE	0.5078125	-0.91	5.38	6.29	1.329827138
POMD	0.57541667	-1.66	4.83	6.49	1.470729716
PRED	1.54421875	-1.81	8.5	10.31	2.04357976
PRMD	0.50083333	-1.33	5.74	7.07	1.46017941
RB	-1.8089583	-3.08	0.24	3.32	0.622232897
SPP2	-0.72	-0.72	-0.72	0	7.79188E-16
TIME	-0.0806771	-1.49	4.31	5.8	1.224974008
TO	1.65015625	-2.12	6.25	8.37	1.558434399
TPP3	-0.9930208	-1.33	0.3	1.63	0.335180251
TTR	-0.6872917	-2.47	1.37	3.84	0.697666236
VBD	-0.9845313	-1.32	0.15	1.47	0.280740959
VPRT	-0.6846875	-1.69	0.38	2.07	0.347910602
XX0	-0.0469792	-1.39	2.64	4.03	0.862314698
[BEMA]	-1.09	-2.65	1.51	4.16	0.777943322
[BYPA]	0.08760417	-0.62	6.23	6.85	1.41121814
[CONT]	-0.7144792	-0.73	-0.53	0.2	0.049771621
[PASS]	0.32651042	-1.45	4.73	6.18	1.121475192
[PASTP]	0.18588542	-0.25	8	8.25	1.766325273
[PEAS]	0.41098958	-1.65	5.02	6.67	1.215672765
[PIRE]	-0.2184375	-0.64	5.36	6	1.217320315
[PRESP]	0.66744792	-0.59	6.71	7.3	1.500741962
[PRIV]	-0.5611979	-1.73	1.13	2.86	0.618094625
[PROD]	-0.6520833	-0.86	1.94	2.8	0.461158152
[PUBV]	-0.6214583	-1.43	3.15	4.58	0.74964631
[SERE]	2.55760417	-0.25	23.75	24	5.160698489
[SPAU]	0.42911458	-2.2	8.2	10.4	1.911849724
[SUAV]	0.71635417	-0.94	5.87	6.81	1.466915858
[THATD]	-0.4398438	-0.76	2.39	3.15	0.526290462
[WHCL]	-0.1795833	-0.6	5.8	6.4	1.110564138
[WHOBJ]	-0.7726562	-0.82	1.12	1.94	0.289481802
[WHSUB]	-0.5272396	-1.05	4.9	5.95	0.987787832
[WZPAST]	-0.1407292	-0.81	3.77	4.58	0.954278044
[WZPRES]	1.08401042	-0.89	10.5	11.39	2.031188253

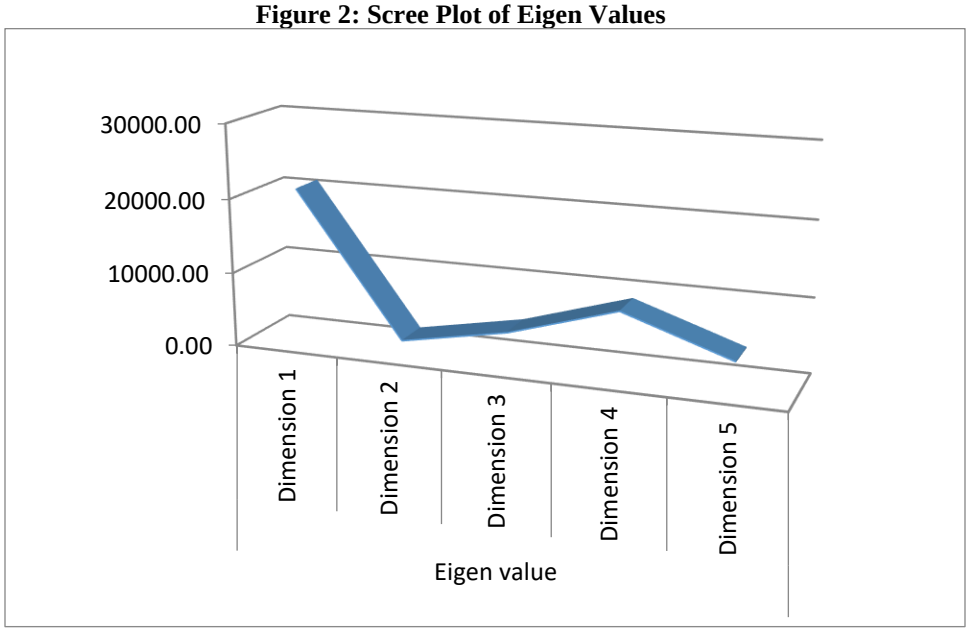
Then factor analysis was applied in order to find out the percentages of shared variance and eigenvalues to trace textual variations. In this way, a huge number can be abridged to smaller number of variables of linguistic features. Every linguistic feature is representative of a function in a dimension.

These eigenvalues are direct directories of variance in dimensions. They give method to examine characteristic break; a point where every dimension contributes. Both table 2 and figure 2 indicate variance in dimensions and according to it, dimension 1 has the highest variance.

Table 2: Eigen Values and Shared Variance

Dimension No	Eigenvalue	Percentage of Shared Variance
D 1	21050.01	-209.3
D 2	1741.63	0.00
D 3	4453.59	0.03
D 4	8835.37	-0.01
D 5	3951.02	0.04

Figure 2: Scree Plot of Eigen Values



Mean value, range, standard deviation, minimum, and maximum values of every dimension are given in table 3.

Table 3: Dimensional Statistics of all dimensions

Linguistic Dimensions	Mean	Minimum Value	Maximum Value	Range	Standard Deviation
Dimension 1	-9.243333333	-23.64	3.35	26.99	4.931831572
Dimension 2	-1.5278125	-7.09	7.58	14.67	2.602318621
Dimension 3	3.695260417	-8.18	11.68	19.86	3.096898285
Dimension 4	5.268645833	-4.04	17.99	22.03	4.284218971
Dimension 5	3.30421875	-3.92	13.53	17.45	3.116239077

Co-occurrence of linguistic features in certain texts indicates that they perform communicative functions which are commonly shared. Thus, the interpretation of these dimensions involves communicative as well as functional aspects of these linguistic features. Editorials collected from The Nation on the theme of Covid-19 have been analyzed below according to five dimensions given by Biber.

4.1. Involved Vs Informational

Dispersion of the corpus is given in figure below. Mean score of the dimension 1 is indicated through horizontal line. Here negative scores are the indicators of information while positive scores are the indicators of involvedness. According to figure 3, text has bent towards informational side rather than involvedness and more tendency of Broadcast than any other text type.

Factorial structure of dimension 1 is presented in following table. The linguistic features present in this table are the representative of this dimension and hence the root cause of its label as involved vs informational. The positive and negative signs with the figures show their tendency of being informational or involved.

Figure 3: D 1 genre type

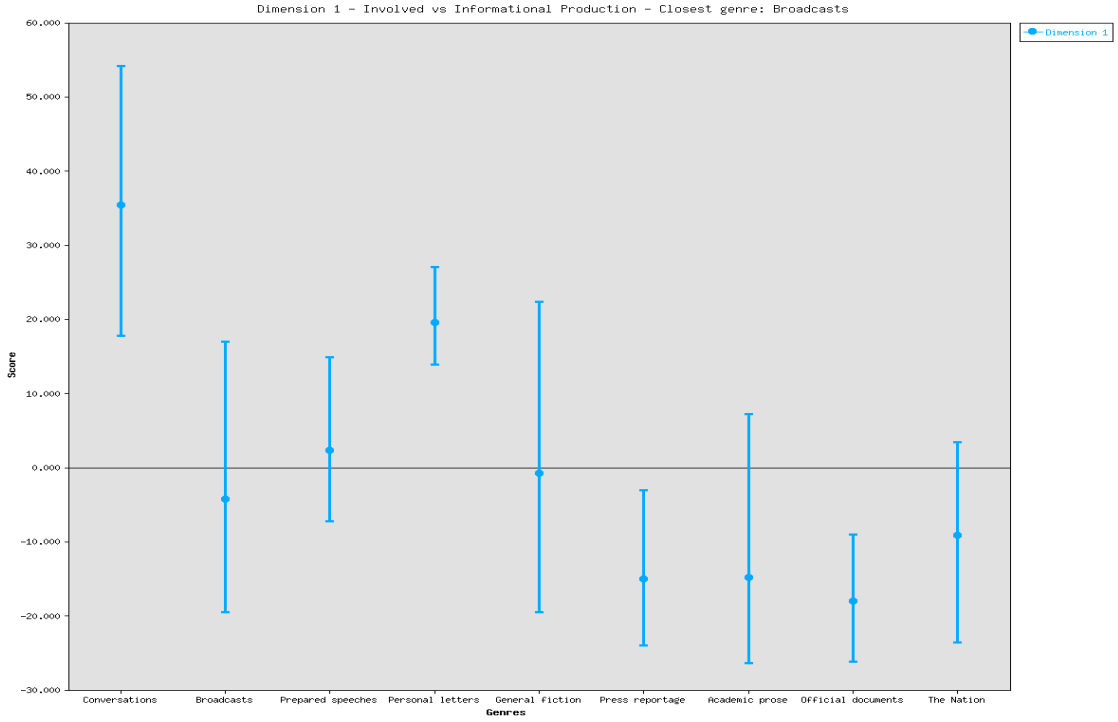


Table 4: D 1 Factorial Structure

Dimension 1			
Negative Linguistic Feature		Positive Linguistic Feature	
PRIV	-0.56	DEMP	0.43
THATD	-0.44	PIT	0.23
CONT	-0.71	SERE	2.56
VPRT	-0.68	POMD	0.58
SPP2	-0.72	COND	0.22
EMPH	-0.09	AWL	1.32
PROD	-0.69	PLACE	0.51
FPP1	-0.74	PASS	0.33
CAUS	-0.22	WZPRES	1.08
BEMA	-1.09		
DPAR	-0.37		
INPR	-0.57		
HDG	-0.45		
AMP	-0.3		
WHCL	-0.18		
RB	-1.81		
TTR	-0.69		
WZPAST	-0.14		

In multidimensional model (1988), Biber has prescribed not only labels of the dimensions but also the cut off point for every dimension to follow. According to him, only those values will be considered for the analysis which are above 0.35. The linguistic features with values less than that will not be considered for analysis. In the table above, there are a few features with values less than 0.35 for example, conditional adverbial subordinators, pronoun it, and agentless passive. In the same way, positive side too has some features which have lesser values for example; participial WHIZ deletion relative, WH-clauses, amplifiers, causative adverbial subordinators, and emphatic.

Highest values have been observed on positive side. The linguistic features for example; present participial WHIZ deletion, word length, and sentence relative, have loadings of 1.08, 1.32, and 2.56 respectively. Higher values of these features reflect that the content is more informational and contains much information related to Covid-19. Word length is a phenomenon which has impacted the meaning to great extent. Such as;

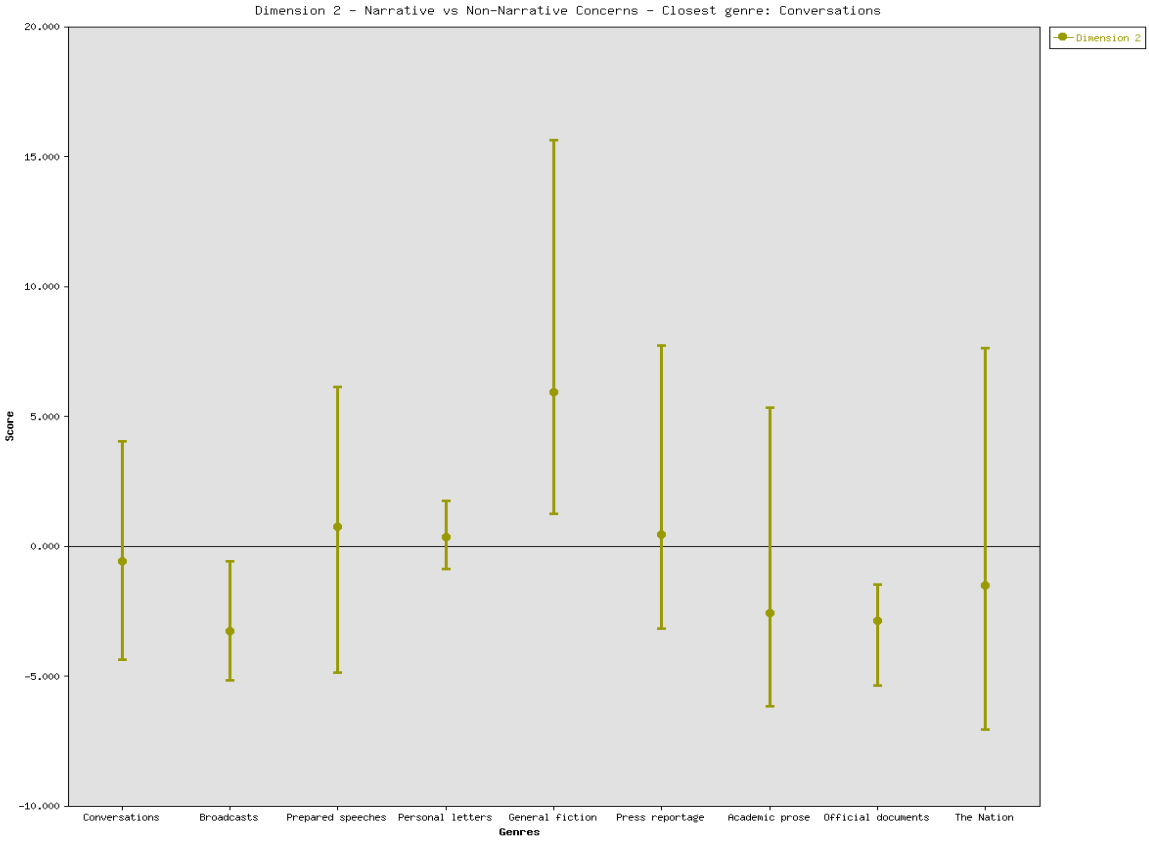
The_DT 30_CD %_NN plunge_NN in_IN the_DT oil_NN price_NN ,_, which_WDT is_VBZ the_DT biggest_JJS fall_NN since_IN the_DT First_NNP Gulf_NNP war_NN ,_, is_VBZ nothing_NN short_JJ of_IN God_NNP sent_VBD help_NN ._.

Other features which have less values but are also found on positive side have their contribution too in adding information in the content such as and past participial WHIZ deletion, agentless passives, and place adverbials. Their function is to modify nouns to convey more information.

4.2. Narrative Vs Non-narrative

Meanings of positive and negative scores are different in dimension 2. Here positive scores show that the text is narrative and negative scores show that the text is non- narrative. Following figure shows that the closest text type in according to dimension two is conversation and there is more deviation from general fiction which means that text has the qualities of non- narrative form.

Figure 4: D 2 genre type



The major function of dimension two is to describe whether the text is written in narrative style or non –narrative style. The first step in analysis is to point out the values which are less than that of cut off point which are two here i.e. analytical negation, and past participial WHIZ deletion relatives. Their values are -0.05 and -0.14 respectively. On the other hand there are only three features on the positive side which are supposed to be considered for analysis as their values are higher. These three features are; word length, present participial clauses, and perfect aspect with values of 1.32, 0.67, and0.41 respectively. Their higher values second the results of figure 4 that the text is written in non- narrative style such as;

However_RB ,_, COVID_NNP -_HYPH 19_CD also_RB teaches_VBZ us_PRP that_IN remittances_NNS can_MD be_VB fickle_JJ and_CC more_RBR affected_VBN by_IN the_DT economic_JJ slump_NN compared_VBN to_IN foreign_JJ direct_JJ investment_NN (_-LRB- FDI_NNP)_-RRB- ._.

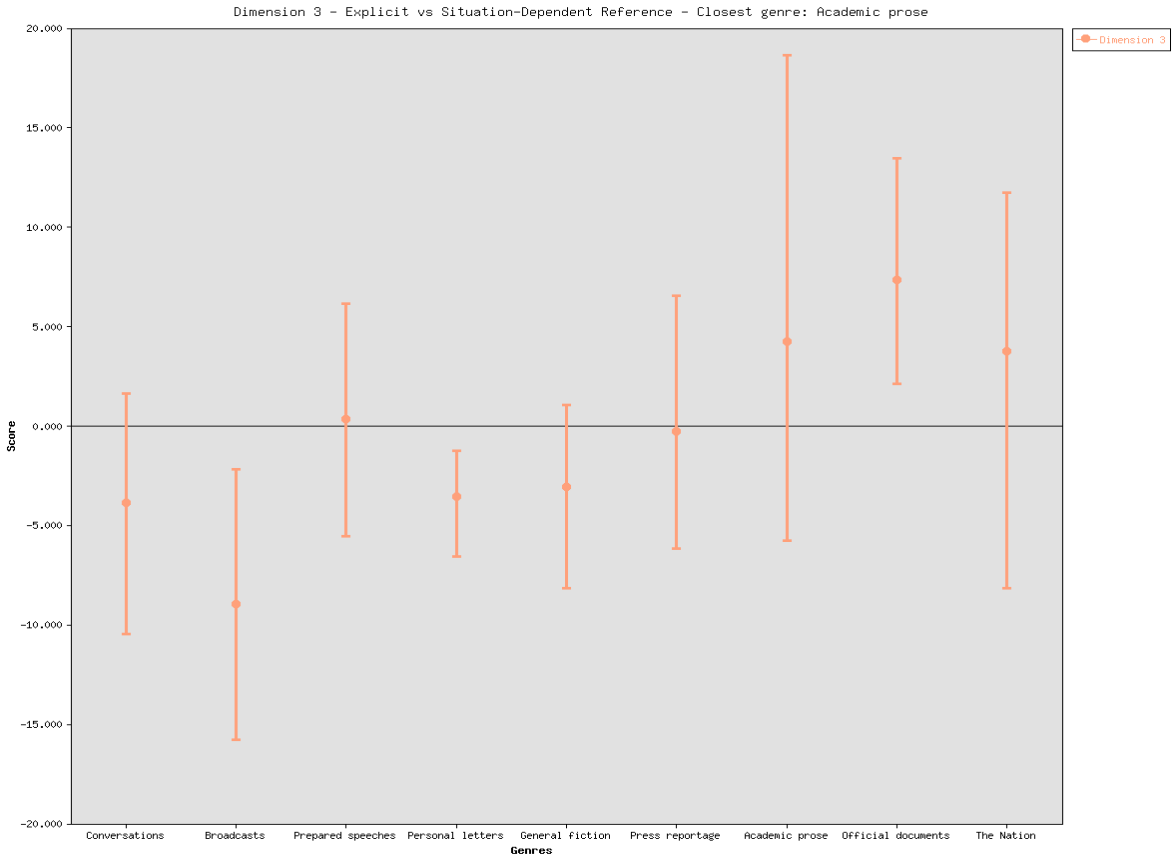
Table 5: D 2 Factorial Structure

Dimension 2			
Negative Linguistic Feature		Positive Linguistic Feature	
VBD	-0.98	PEAS	0.41
TPP3	-0.99	PRESP	0.67
PUBV	-0.62	AWL	1.32
XX0	-0.05		
VPRT	-0.68		
WZPAST	-0.14		

4.3. Explicit Vs Situation Dependent Reference

The writings of editorials of The Nation have shown bent towards situation dependency rather than being explicit. It means that the themes of these editorials revolve around Covid-19 only. In following figure, positive scores are representatives of explicitness of the text while the dependency on the situation is shown through negative scores. Results of dimension three are in favor of the results of first two dimensions as the closest text type here is academic writing which again shows that the text is written in non-narrative style.

Figure 5: D3 genre type



Label of third dimension according to Biber (1991) is explicit vs situation dependent reference. As values of linguistic features according to dimension three are given in table 6, two out of them on negative side have values which are less than 0.35 for example; time adverbial, and pied piping relative clauses with the values of -0.08 and -0.22 respectively. Higher weight of positive side is due to the features such as nominalization, phrasal coordination, and place adverbials. Nominalization is traced more in form of words that have endings like ness, ions, ment, ity, ities etc. An extract of tagged data to explain it is;

This_DT will_MD protect_VB healthcare_NN workers_NNS including_VBG doctors_NNS and_CC nurses_NNS from_IN unnecessary_JJ exposure_NN and_CC allow_VB them_PRP to_TO dedicate_VB their_PRP$ limited_JJ time_NN and_CC resources_NNS towards_IN essential_JJ functions_NNS ._

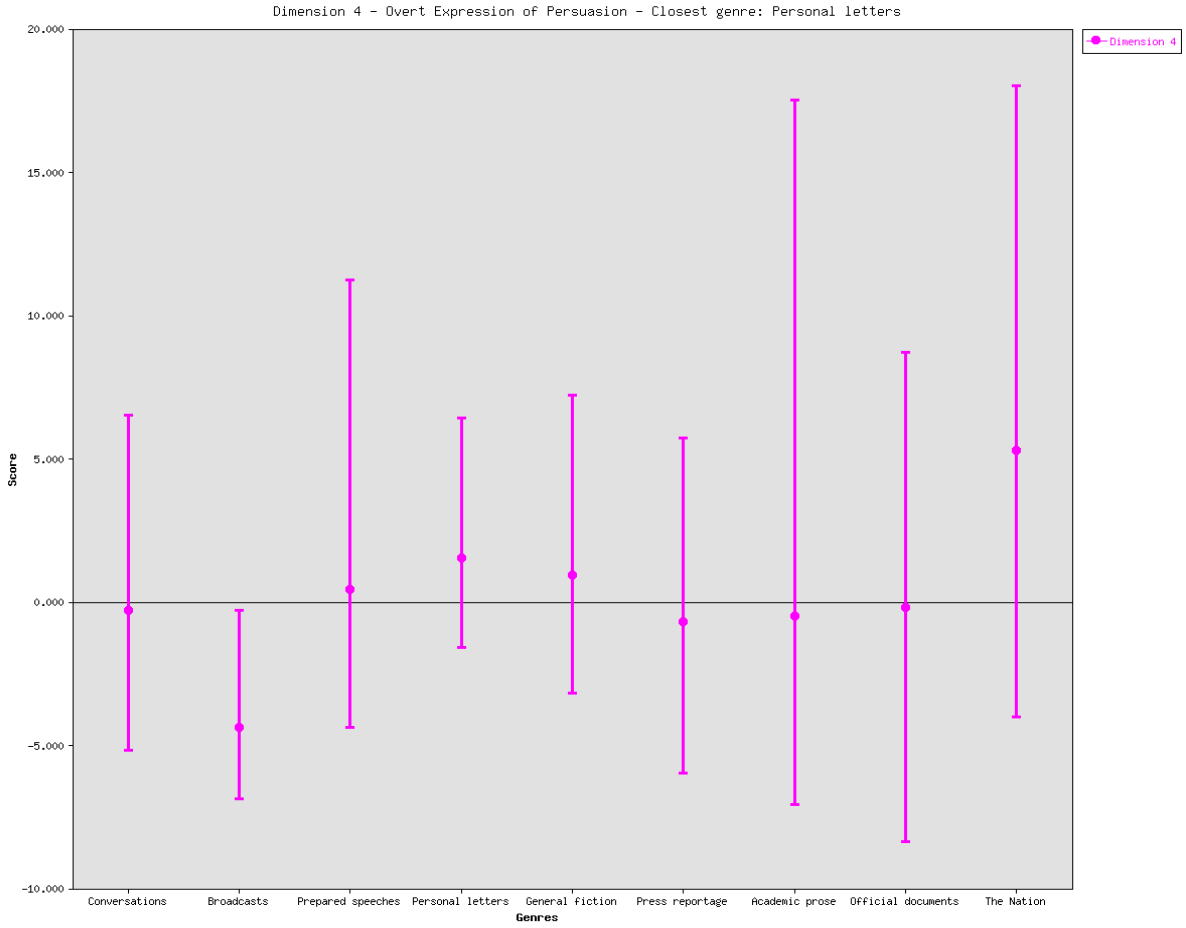
Table 6: D 3 Factorial Structures

Dimension 3			
Negative Linguistic Feature		Positive Linguistic Feature	
WHOBJ	-0.77	PHC	1.77
PIRE	-0.22	NOMZ	1.94
WHSUB	-0.53	PLACE	0.51
TIME	-0.08		
RB	-1.81		

4.4. Dimension 4: Overt Expression of Persuasion

Figure number six presents a graph which is representative of genre type according to dimension four. It shows that the editorials of the selected newspaper have persuasive style of writing. They try to convince the readers and would like to bring them to their own point of view by persuading them. This persuasion is very explicit about the issues which are relevant to the theme of Covid-19. Like previous dimensions, here too positive and negative scores are indicators of genre and text types. Overt kind of persuasion is presented by positive scores and covert kind of persuasion is indicated by negative scores. However, the genre type here is closer to personal letters.

Figure 6: D 4 genre type



In previous three dimensions, linguistic features have been found on both negative and positive sides but unlikely, in dimension four there is not even a single feature found on negative side. However, there are six features on the positive side and surprisingly all of them have values more than that of prescribed cut off value given by Biber. These features are; infinities, predictive modals, conditional adverbial subordinators, suasive verbs, split auxiliaries, and necessity modals with the values of 0.43, 0.72, 0.22, 0.5, 1.65 and 2 respectively. Out of all these, necessity

modals has the highest value which means that the words such as should, ought, and must have been used frequently to persuade about something related to Covid- 19 for example;
Therefore_RB ,_, political_JJ parties_NNS should_MD not_RB waste_VB their_PRP$ energies_NNS on_IN political_JJ point-scoring_NN ._.

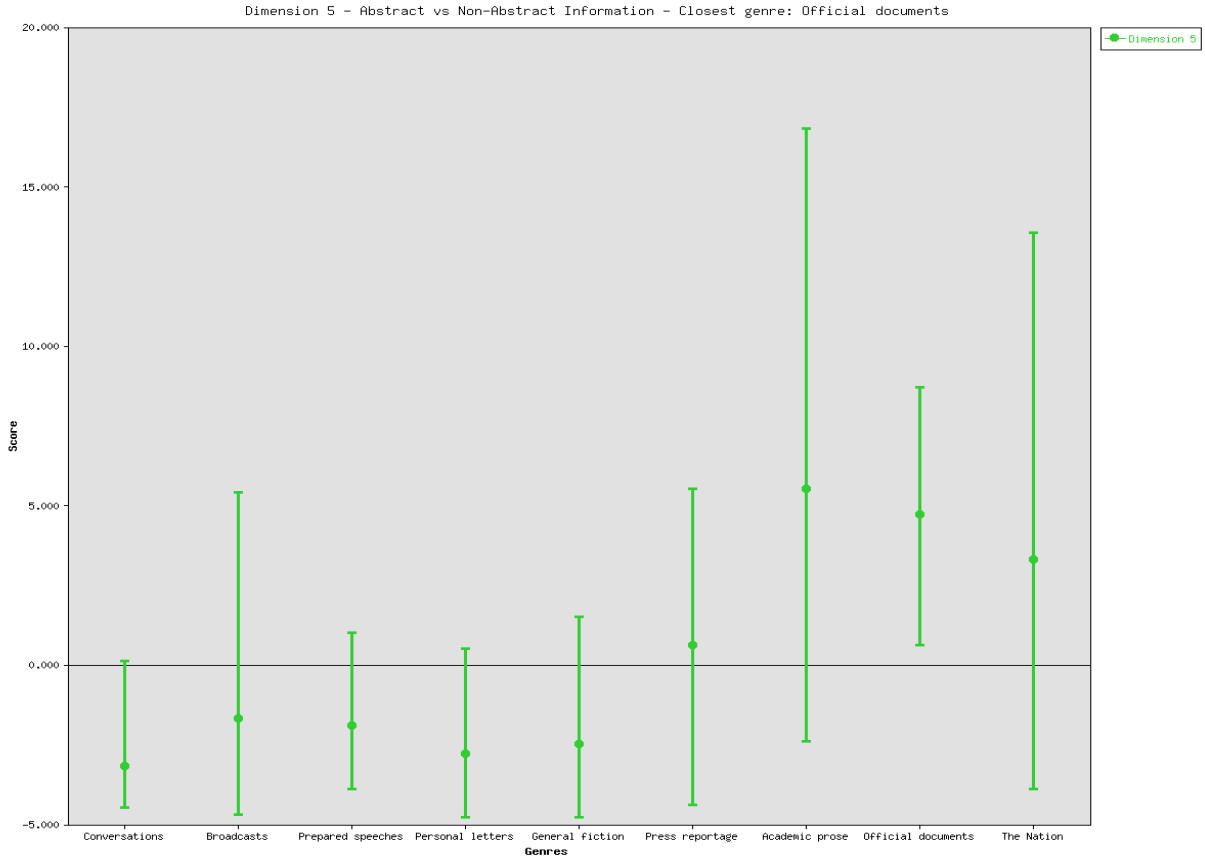
Table 7: D 4 Factorial Structures

Dimension 4		
Negative Linguistic Feature	Positive Linguistic Feature	
	TO	1.65
	PRMD	0.5
	COND	0.22
	SUAV	0.72
	SPAU	0.43
	NEMD	2
---------No negative features----------		

4.5. Abstract Vs Non-abstract Information

The last dimension i.e. dimension five follows the trend set by previous four dimensions and is on the same pattern. Bent towards positive scores reflect that the text is written in abstract form while bent towards negative side shows non- abstraction. Following figure shows that the information is provided in abstract form and has closer affinity with official documents.

Figure 7: D 5 genre type



There are only two linguistic features on the negative side of dimension five i.e. type-token ratio, and past participial WHIZ deletion relatives. But as per the rule defined by Biber (1991, 1992, 1994, 1995, 2002, 2009) the values lesser than 0.35 are not supposed to be taken under consideration so one feature from the negative side i.e. past participial WHIZ deletion relatives with the value of -0.14 is going to be excluded. The features traced on the positive side of

dimension five are indicators of procedural discourse. These features include; predicative adjectives, other adverbial subordinators, by-passives, past participial clauses, agentless passives, and conjuncts. There values have been provided in following table and example of most commonly found feature i.e. OSUB is given below from the extract of an editorial from The Nation written on the them of Covid -19;

While_IN this_DT opens_VBZ up_RP a_DT pandora_NN of_IN issues_NNS regarding_VBG a_DT uniform_NN and_CC needing_VBG a_DT coherent_JJ narrative_NN from_IN only_RB the_DT top_JJ tier_NN of_IN the_DT government_NN in_IN times_NNS of_IN a_DT national_JJ crisis_NN --_: a_DT policy_NN reminiscent_NN of_IN the_DT last_JJ thirty_CD years_NNS of_IN government_NN --_: however_RB ,_, any_DT individual_JJ making_VBG an_DT effort_NN to_TO add_VB on_IN to_TO the_DT efforts_NNS of_IN the_DT government_NN must_MD be_VB encouraged_VBN and_CC not_RB taken_VBN as_IN a_DT political_JJ threat_NN to_TO any_DT party_NN or_CC the_DT state_NN ._.

Table 8: D 5 Factorial Structures

FACTOR 5			
Negative Linguistic Feature		Positive Linguistic Feature	
WZPAST	-0.14	CONJ	1.68
TTR	-0.69	PASS	0.33
		PASTP	0.19
		BYPA	0.09
		OSUB	1.92
		PRED	1.54

5. Conclusion

The application of MD analysis yielded five dimensions with a variety of genre distribution such as broadcasts, personal letters, conversations, official documents, and academic prose, which shows the occurrence of linguistic features in complementary distribution. Every dimension brought difference in form of dominant linguistic features for instance; AWL Average word length, NEMD Necessity models, OSUB Other adverbial subordinators, SERE Sentence relatives, and NOMZ Nominalizations. Dominance of these linguistic features and genres show that the texts of editorials which were selected for the present study were written in a narrative yet formal manner. The text is affective and interactional. It can be inferred from these results that the editorials having the content related to Covid-19 have more informational tendency and lesser trend towards conversational style towards presenting facts. The results also revealed that the data is situation dependent as the whole discussion revolves around the theme of Covid-19 which was a prevalent phenomenon at the prescribed time frame covering data selection phase. Moreover, the text has used persuasive expressions to convince the readers for taking precautionary measures. The data is more abstract than non-abstract in terms of informational content. This means that the linguistic features used have brought abstraction the writings.

References

Ahmad, S., & Ali, S. (2019). Linguistic variation across press reportage in Pakistani print media: A multi-dimensional analysis. *Journal of Media Studies*, 32(2).

Ahmad, S., & Mahmood, A. (2016). Linguistic Variation among Newspapers in Pakistani Print Media: A Multidimensional Analysis. *Kashmir Journal of Language Research*, 19(1).

Alvi, A. (2017). Linguistic variation across press editorials in Pakistani print media: A multidimensional analysis. *Unpublished doctoral dissertation). GC University, Faisalabad*.

Biber, D. (1991). *Variation across speech and writing*. Cambridge University Press.

Biber, D. (1992). On the complexity of discourse complexity: A multidimensional analysis. *Discourse Processes*, *15*(2), 133-163.

Biber, D. (1994). An analytical framework for register studies. *Sociolinguistic perspectives on register*, 31-56.

Biber, D. (1995). *Dimensions of register variation: A cross-linguistic comparison*. Cambridge University Press.

Biber, D., & Conrad, S. (2009). Register, genre, and style. Cambridge University Press.

Biber, D., Conrad, S., Reppen, R., Byrd, P., & Helt, M. (2002). Speaking and writing in the university: A multidimensional comparison. *TESOL quarterly*, *36*(1), 9-48.

Idda, A., & Sofi, Y. (2020). Corpus-based analysis of the most frequent adjective on Covid-19. *Journal of EFL and Linguistics*, *5*(2), 505-515.